CF-310S

GEP Model

E Model

SONY
FM/SW/MW CASSETTE-CORDER CF-310S/VARIABLE MONITOR

FM/SW/MW RADIO CASSETTE-CORDER

SPECIFICATIONS

RADIO SECTION

Circuit: Superheterodyne

Frequency Ranges:
FM 87.5 ~ 108 MHz (3.43 ~ 2.78 m)
SW 3.9 ~ 12 MHz (77 ~ 25 m)
MW 530 ~ 1,605 kHz (566 ~ 187 m)

Intermediate Frequencies:
FM 10.7 MHz
MW, SW 455 kHz

Antennas:
FM, SW built-in telescopic
(5 section, 85 cm long)
MW built-in ferrite-rod
(10 mm dia x 120 mm)

Current Drain:
(at no signal)
FM 54 mA
MW, SW 51 mA

TAPE RECORDER SECTION

Track: Two-track monaural

Tape Speed: 4.8 cm/s ($1\frac{7}{8}$ ips)

Record Bias Frequency: Approximately 40 kHz

Frequency Response: 80 ~ 8,000 Hz

Record/playback Head: PP134-36 (250 Ω/1 kHz)

Erase Head: EBF5-02B (ferrite)

Motor: D-009G3 (DC governor)

Electret Condenser Microphone: C-1002A

Automatic Shut-off Mechanism:
Tape-tension-detecting system
(record and playback modes)

Input:
MIC (mini)
maximum sensitivity: −72 dB (0.2 mV)
impedance: for low-impedance microphone

Output:
MONITOR
normal level: 0 dB (0.775 V) with 10 kΩ load
load impedance: 8 Ω earphone, 10 kΩ or more

GENERAL

Power Requirements:
AC 100 ~ 110 V, 115 ~ 127 V, 200 ~ 220 V, 230 ~ 250 V, 50/60 Hz
DC 6 V
Battery size "C" 4 pcs
Rechargeable battery BP-16

Battery's Life:
Long-life dry cell
Approximately 6 hours in continuous recording (RADIO switch: OFF)
Rechargeable battery 8 hours in continuous recording (RADIO switch: OFF)
(charging time: approximately 21 hours)

Power Consumption: AC 7.5 W

Speaker: 9.2 cm ($3\frac{1}{2}$") dia, 8 Ω

Output Power: 1 W

Semiconductors: 1 FET (included in electret condenser microphone), 17 transistors and 16 diodes

Dimensions:
279 (w) x 200 (h) x 81 (d) mm
11 (w) x $7\frac{7}{8}$ (h) x $3\frac{3}{16}$ (d) inches

Weight: 2.5 kg, 5 lb 9 oz (with batteries)

Supplied Accessories:
Power cord (DK-33)
Tape cassette (C-30)
Earphone (ME-20)
Long-Life Batteries (size "C" 4 pcs)
Shorting plug (SP-100)
Head-cleaning tips
Printed matters

SONY®

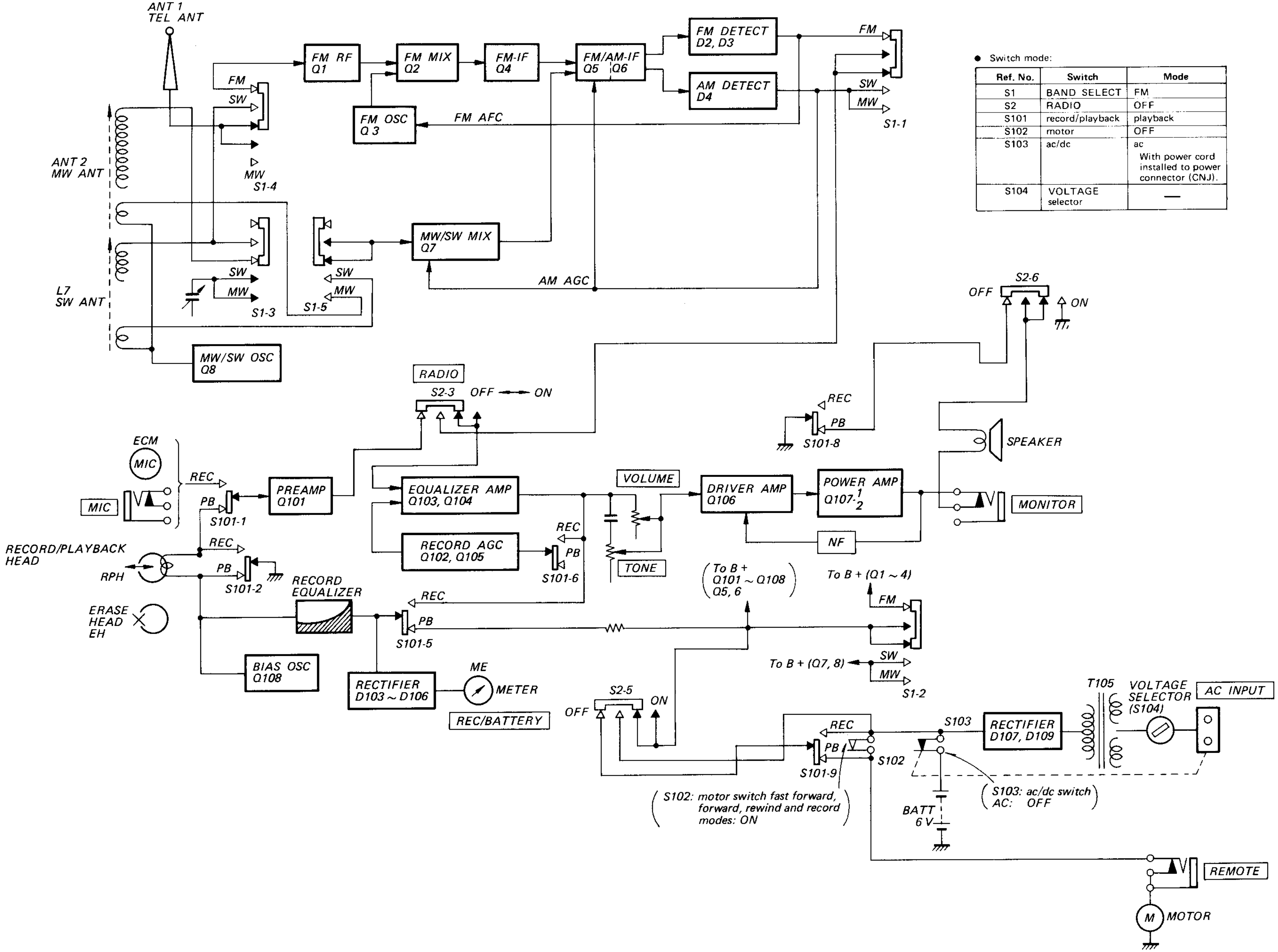
SERVICE MANUAL

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM

- Switch mode:

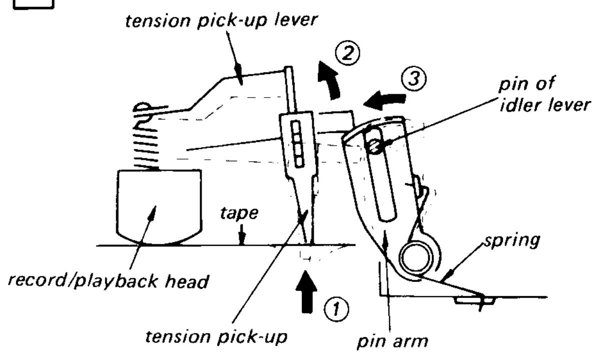
Ref. No.	Switch	Mode
S1	BAND SELECT	FM
S2	RADIO	OFF
S101	record/playback	playback
S102	motor	OFF
S103	ac/dc	ac With power cord installed to power connector (CNJ).
S104	VOLTAGE selector	—


ANT 1
TEL ANT
ANT 2
MW ANT
L7
SW ANT
FM
SW
MW
S1-4
S1-3
S1-5
S1-1
S1-2
FM RF
Q1
FM MIX
Q2
FM OSC
Q 3
FM-IF
Q4
FM/AM-IF
Q5 Q6
FM DETECT
D2, D3
AM DETECT
D4
FM AFC
MW/SW MIX
Q7
AM AGC
MW/SW OSC
Q8
RADIO
S2-3
OFF ← → ON
S2-6
S2-5
OFF
ON
ECM
MIC
REC
PB
S101-1
S101-2
S101-5
S101-6
S101-8
S101-9
PREAMP
Q101
EQUALIZER AMP
Q103, Q104
RECORD AGC
Q102, Q105
VOLUME
TONE
DRIVER AMP
Q106
POWER AMP
Q107-1
2
NF
SPEAKER
MONITOR
RECORD/PLAYBACK
HEAD
RPH
ERASE
HEAD
EH
RECORD
EQUALIZER
BIAS OSC
Q108
RECTIFIER
D103 ~ D106
ME
METER
REC/BATTERY
To B +
Q101 ~ Q108
Q5, 6
To B + (Q1 ~ 4)
To B + (Q7, 8)
S102
S102: motor switch fast forward, forward, rewind and record modes: ON
S103
RECTIFIER
D107, D109
T105
VOLTAGE
SELECTOR
(S104)
AC INPUT
S103: ac/dc switch
AC: OFF
BATT
6 V
REMOTE
M
MOTOR

1-2. AUTOMATIC SHUT-OFF MECHANISM OPERATION

CF-310S mechanism is designed so that the unit will be shut itself off automatically at tape end in record and playback mode. Operation in playback mode is shown step by step in numerical order.

1


tension pick-up lever
②
③
pin of idler lever
tape
spring
record/playback head
①
tension pick-up
pin arm

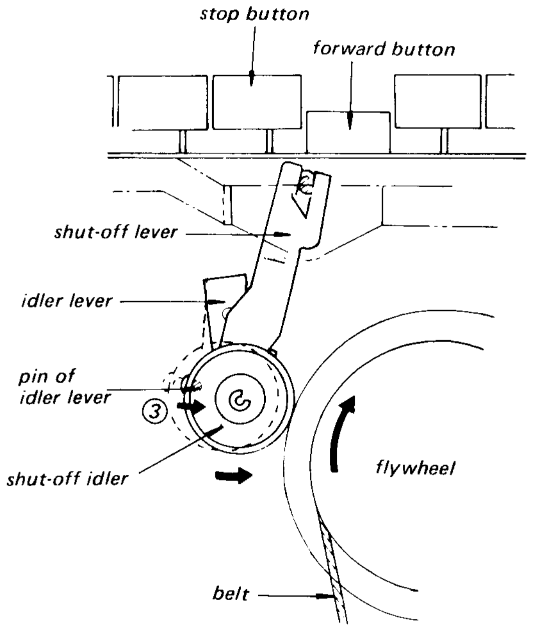
At tape end in playback mode,

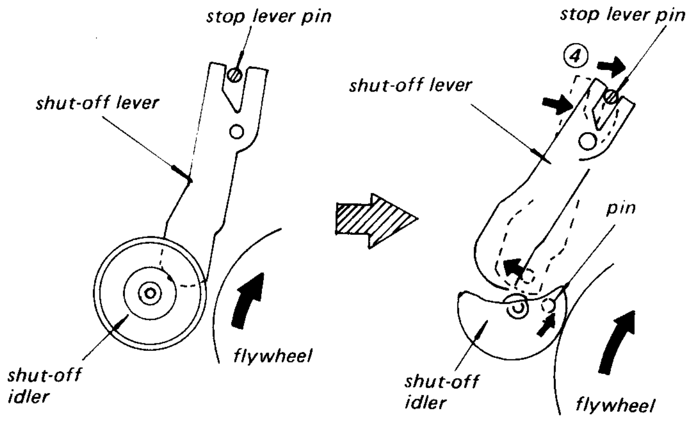
(1) The tension pick-up detects the tape-tension and moves as shown by arrow ①.

(2) The tension pick-up lever moves as shown by arrow ②, because tension pick-up lever is connected to the tension pick-up.

(3) The spring always pushes the pin-arm, so the pin-arm moves the pin of idler lever as shown by arrow ③.

2

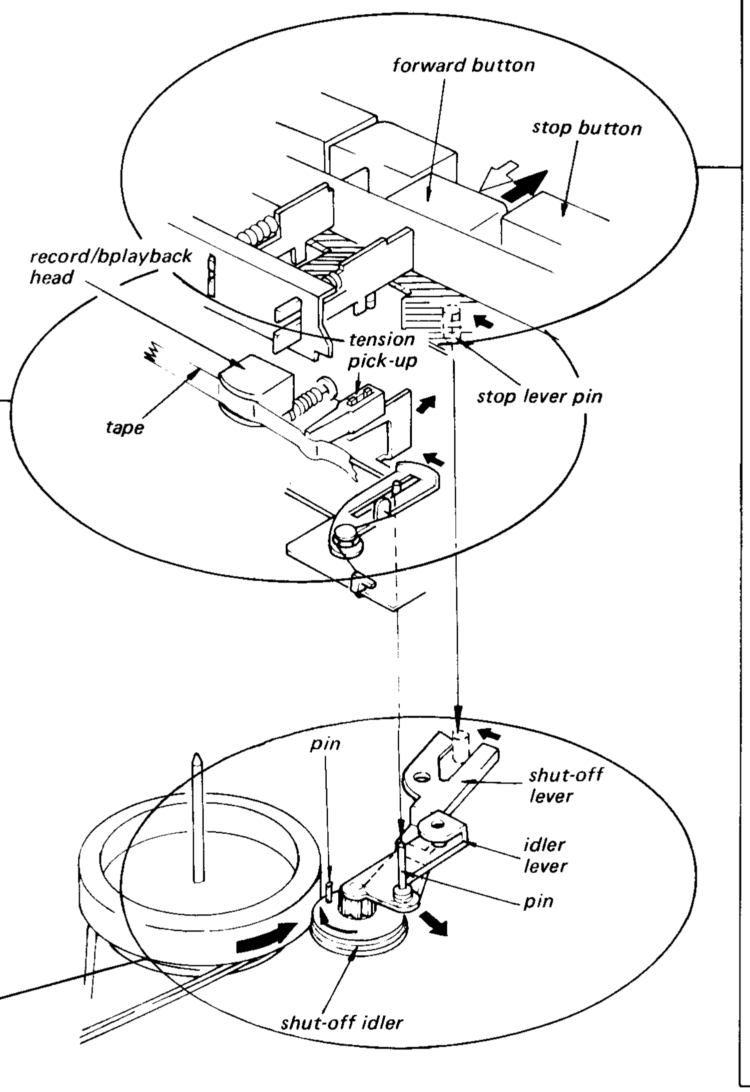

stop button
forward button
shut-off lever
idler lever
pin of idler lever
③
shut-off idler
flywheel
belt


stop lever pin
shut-off lever
shut-off idler
flywheel
stop lever pin
④
shut-off lever
pin
shut-off idler
flywheel

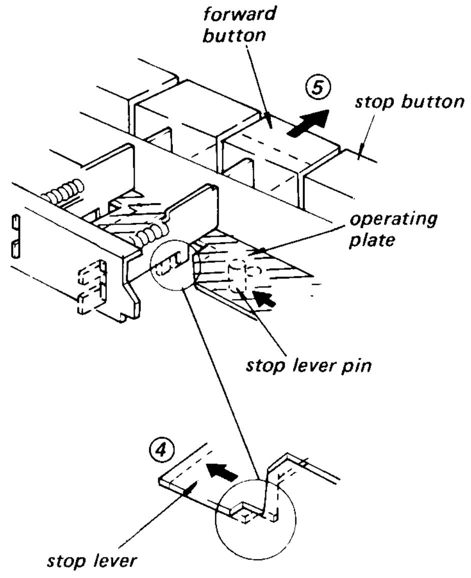
(1) The shut-off idler touches the flywheel, because the pin of idler lever is moved as shown by arrow ③. The shut-off idler rotates.

(2) The pin of rotating shut-off idler pushes the shut-off lever and moves the stop lever pin as shown by arrow ④.

Playback mode


forward button
stop button
record/bplayback head
tension pick-up
stop lever pin
tape
pin
shut-off lever
idler lever
pin
shut-off idler

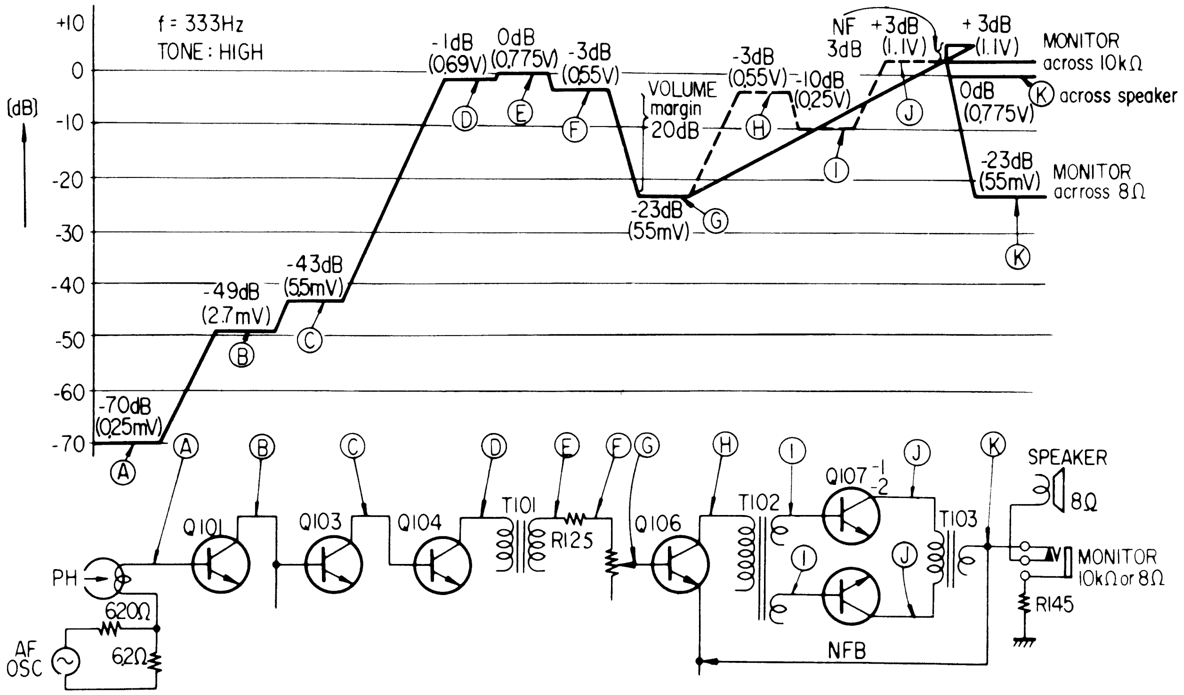
3


forward button
⑤
stop button
operating plate
stop lever pin
④
stop lever

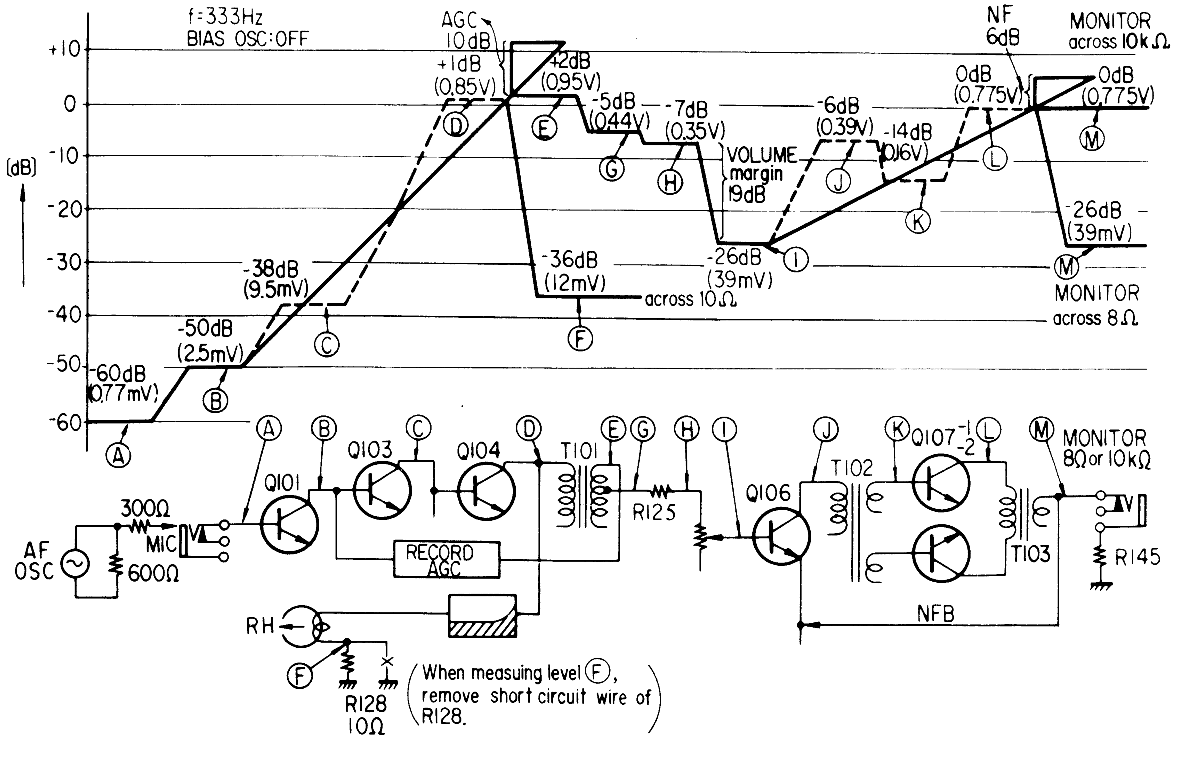
The stop lever pin (operating plate) is moved by the shut-off lever as shown by arrow ④ and releases the forward button.

1-3. LEVEL DIAGRAM

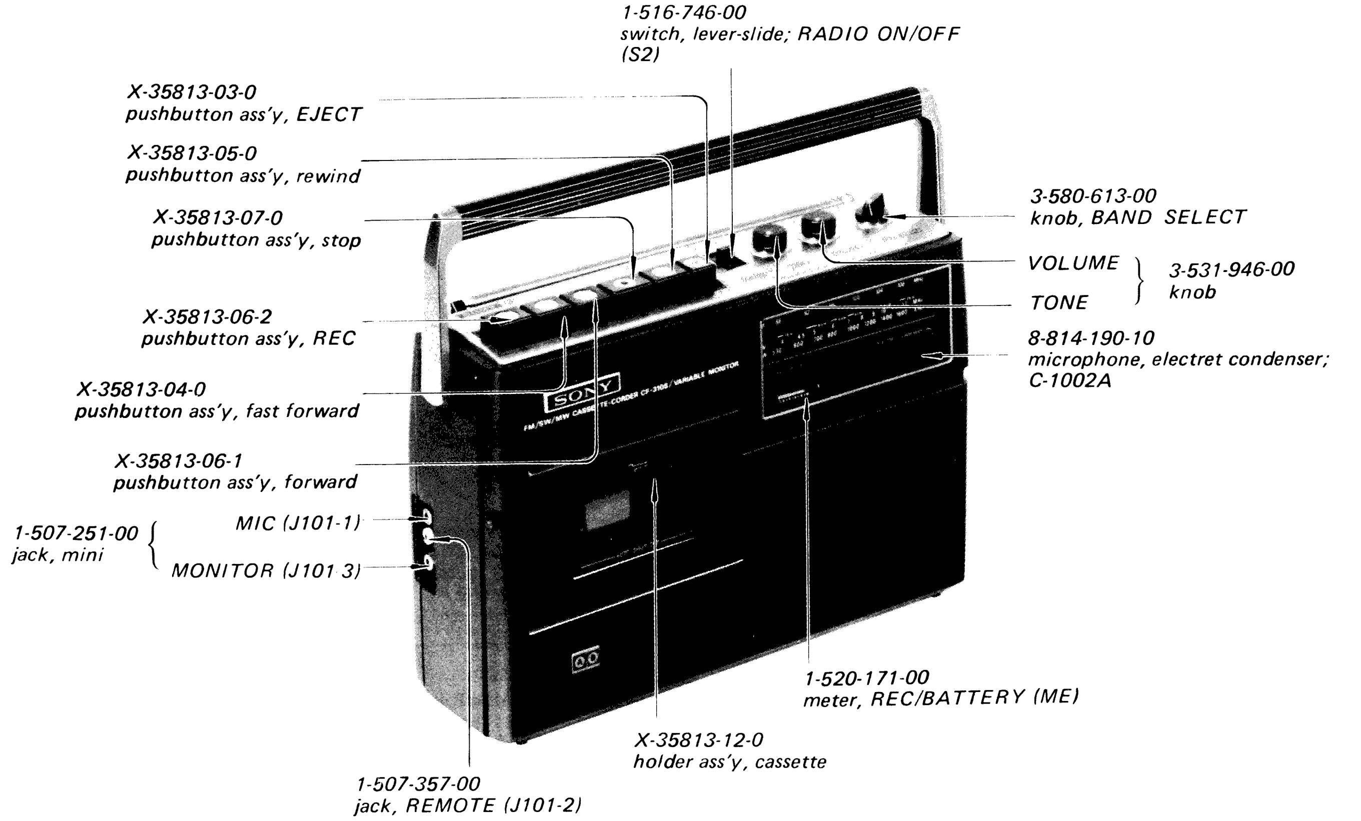
Playback

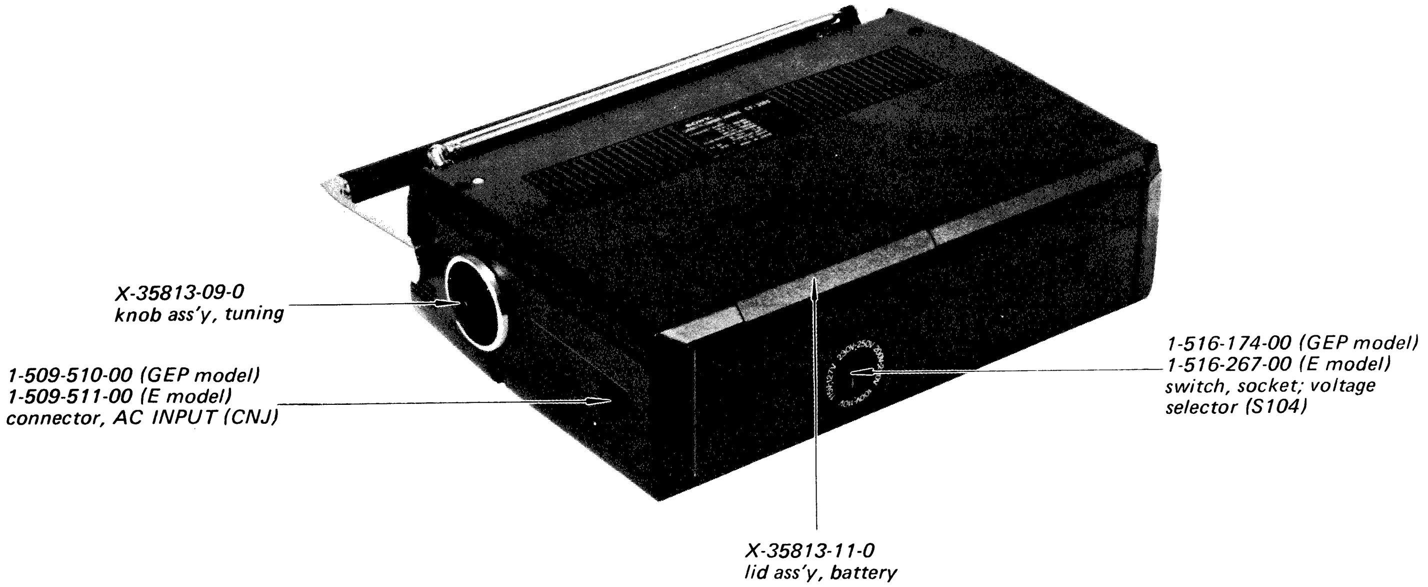

f = 333Hz
TONE : HIGH
+10
0
-10
-20
-30
-40
-50
-60
-70
(dB)
-70dB (0.25mV)
-49dB (2.7mV)
-43dB (55mV)
-1dB (0.69V)
0dB (0.775V)
-3dB (0.55V)
VOLUME margin 20dB
-23dB (55mV)
-3dB (0.55V)
-10dB (0.25V)
NF 3dB
+3dB
+3dB (1.1V)
MONITOR across 10kΩ
0dB (0.775V)
across speaker
-23dB (55mV)
MONITOR acrross 8Ω
A
B
C
D
E
F
G
H
I
J
K
PH
620Ω
62Ω
AF OSC
Q101
Q103
Q104
T101
R125
Q106
T102
Q107-1
-2
T103
SPEAKER
8Ω
MONITOR 10kΩ or 8Ω
R145
NFB

Record


f=333Hz
BIAS OSC: OFF
+10
0
-10
-20
-30
-40
-50
-60
(dB)
-60dB (0.77mV)
-50dB (2.5mV)
-38dB (9.5mV)
AGC 10dB
+1dB (0.85V)
+2dB (0.95V)
-5dB (0.44V)
-7dB (0.35V)
VOLUME margin 19dB
-6dB (0.39V)
-14dB (0.16V)
NF 6dB
0dB (0.775V)
0dB (0.775V)
MONITOR across 10kΩ
-36dB (12mV) across 10Ω
-26dB (39mV)
-26dB (39mV)
MONITOR across 8Ω
A
B
C
D
E
F
G
H
I
J
K
L
M
AF OSC
300Ω
MIC
600Ω
Q101
Q103
Q104
T101
RECORD AGC
R125
Q106
T102
Q107-1
-2
T103
MONITOR 8Ω or 10kΩ
R145
NFB
RH
R128 10Ω
(When measuing level F, remove short circuit wire of R128.)

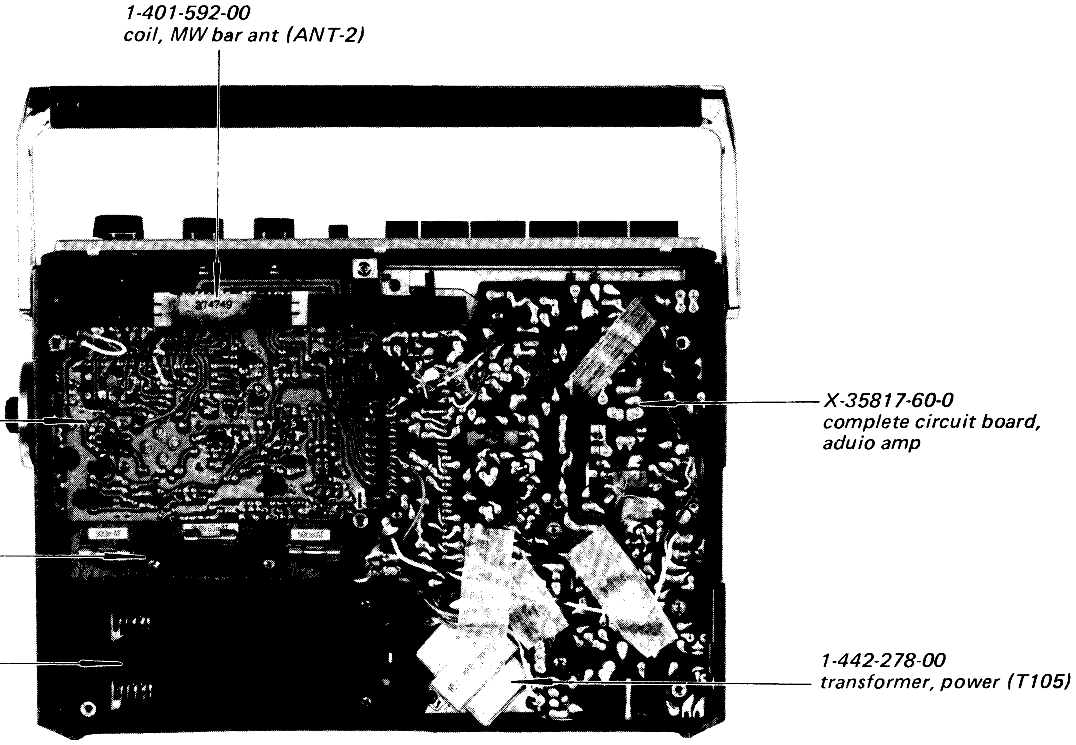
1-4. EXTERNAL VIEWS


1-516-746-00 switch, lever-slide; RADIO ON/OFF (S2)
X-35813-03-0 pushbutton ass'y, EJECT
X-35813-05-0 pushbutton ass'y, rewind
X-35813-07-0 pushbutton ass'y, stop
X-35813-06-2 pushbutton ass'y, REC
X-35813-04-0 pushbutton ass'y, fast forward
X-35813-06-1 pushbutton ass'y, forward
1-507-251-00 jack, mini
MIC (J101-1)
MONITOR (J101-3)
3-580-613-00 knob, BAND SELECT
VOLUME
TONE
3-531-946-00 knob
8-814-190-10 microphone, electret condenser; C-1002A
1-520-171-00 meter, REC/BATTERY (ME)
X-35813-12-0 holder ass'y, cassette
1-507-357-00 jack, REMOTE (J101-2)
SONY

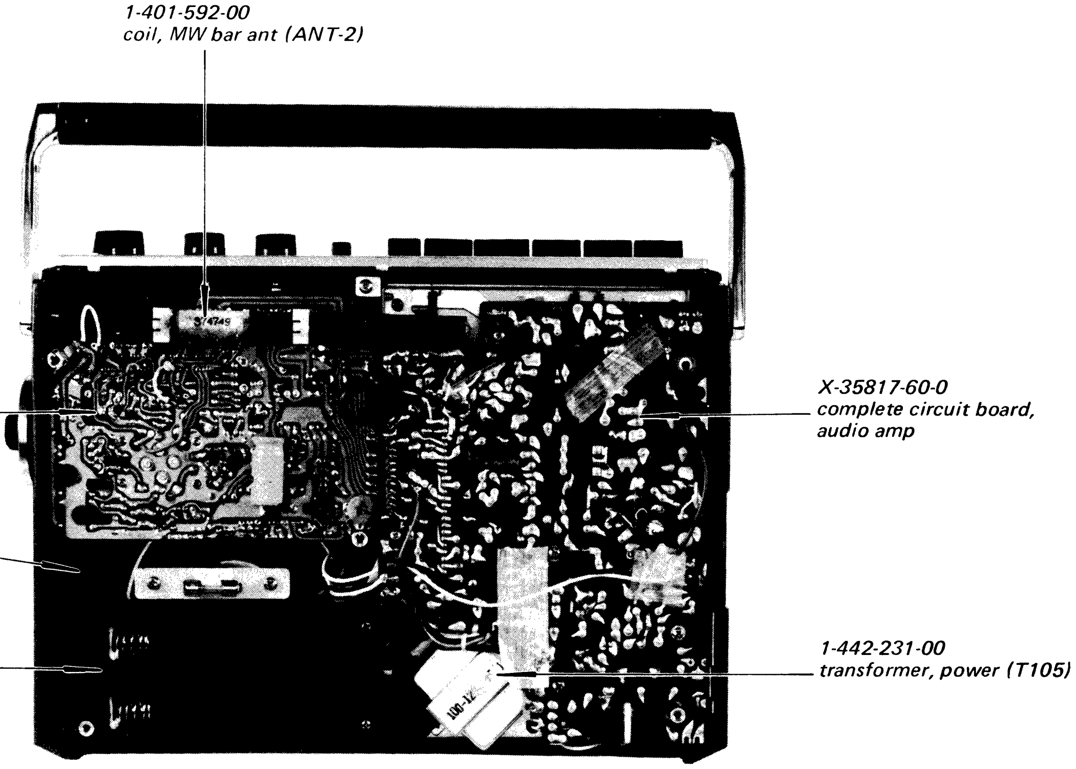

X-35813-09-0 knob ass'y, tuning
1-509-510-00 (GEP model)
1-509-511-00 (E model)
connector, AC INPUT (CNJ)
1-516-174-00 (GEP model)
1-516-267-00 (E model)
switch, socket; voltage selector (S104)
X-35813-11-0 lid ass'y, battery

1-5. INTERNAL VIEWS

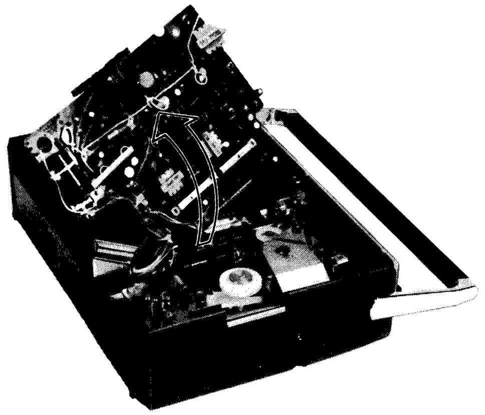
(1) E model


1-401-592-00
coil, MW bar ant (ANT-2)
X-35817-61-0
complete circuit board, radio
X-35817-65-0
complete circuit board, fuse
X-35813-14-0
case ass'y, battery
X-35817-60-0
complete circuit board, aduio amp
1-442-278-00
transformer, power (T105)

(2) GEP model


1-401-592-00
coil, MW bar ant (ANT-2)
X-35817-61-0
complete circuit board, radio
X-35817-66-0
complete circuit board, fuse
X-35813-14-0
case ass'y, battery
X-35817-60-0
complete circuit board, audio amp
1-442-231-00
transformer, power (T105)

③ Remove the circuit board as shown by arrow.



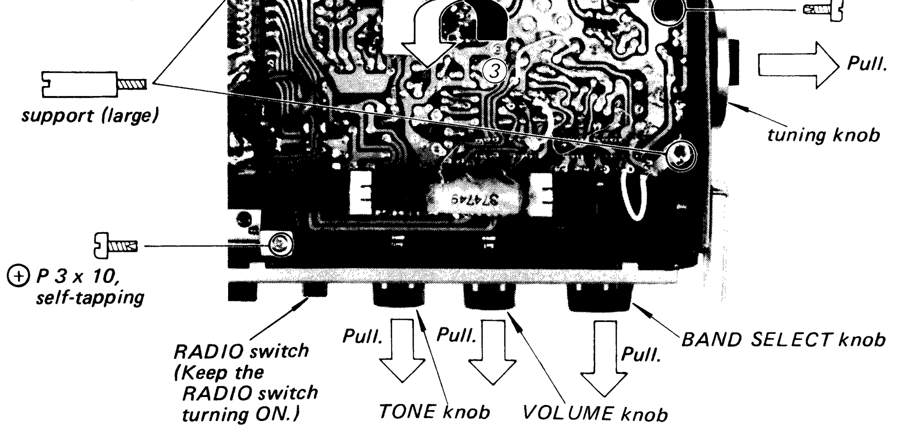
rm,
ad-

Electrical Adjustments for FM Section

Radio Chassis Removal

① Pull off the four knobs.

② Remove the two screws and the two supports.


support (large)
P 3 x 10, self-tapping
Pull.
tuning knob
③
⊕ P 3 x 10, self-tapping
RADIO switch (Keep the RADIO switch turning ON.)
Pull.
Pull.
Pull.
TONE knob
VOLUME knob
BAND SELECT knob

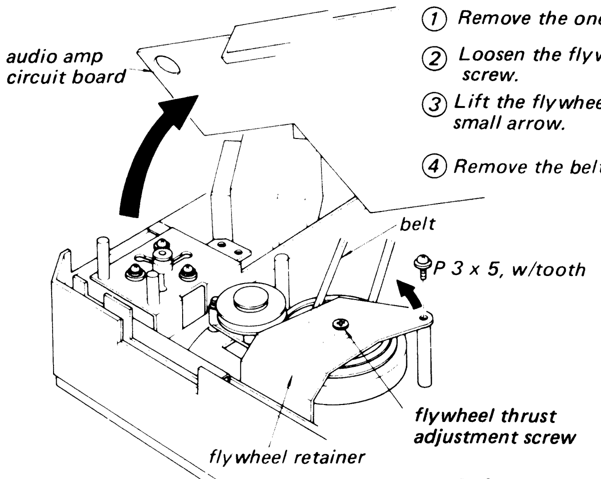
Belt Removal

① Remove the one screw (P 3 x 5, w/tooth).

② Loosen the flywheel thrust adjustment screw.

③ Lift the flywheel retainer up as shown by small arrow.

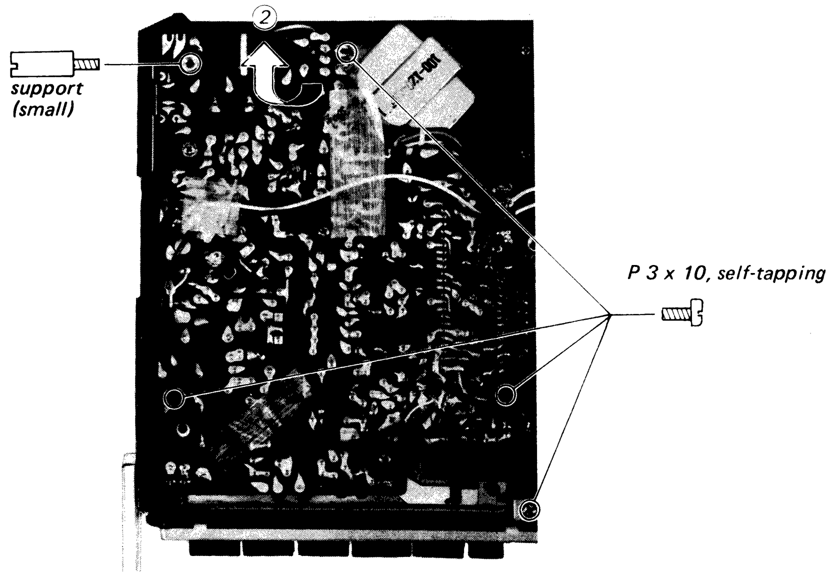
④ Remove the belt.


audio amp circuit board
belt
P 3 x 5, w/tooth
flywheel thrust adjustment screw
flywheel retainer

Note: Before attaching the belt to the flywheel, clean the belt with alcohol moistened swab.

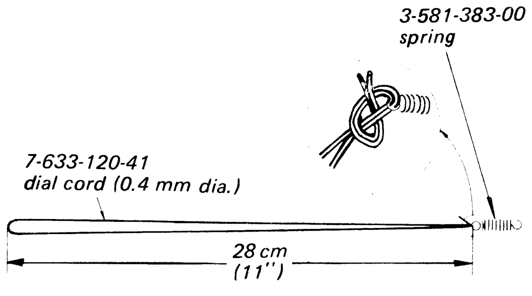
Chassis Removal

① Remove the four screws and one support


support (small)
②
P 3 x 10, self-tapping

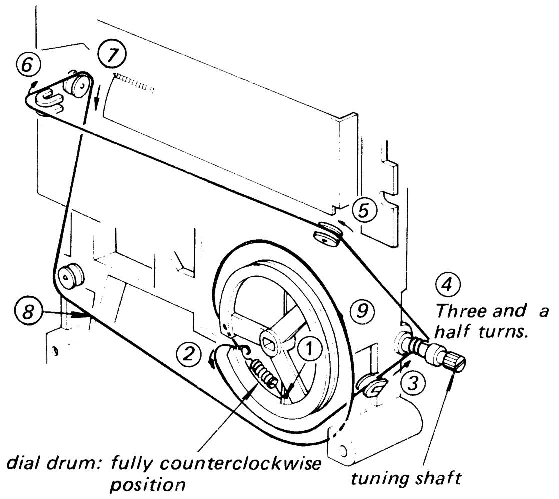
Dial Cord Stringing

1) Dial Cord Assembly


3-581-383-00 spring
7-633-120-41 dial cord (0.4 mm dia.)
28 cm (11")

2) Dial Cord Stringing

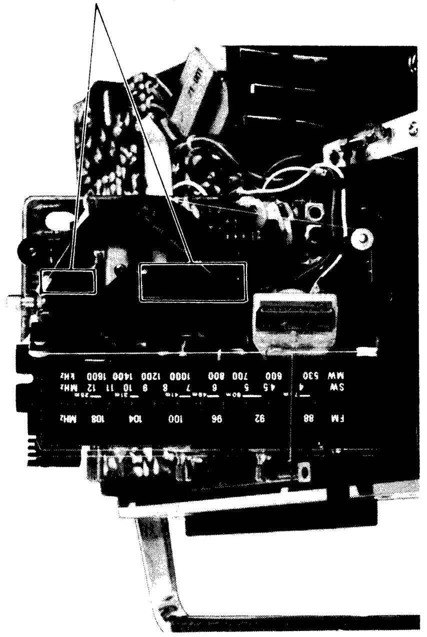
String the dial cord in numerical order.


⑥
⑦
⑤
④
Three and a half turns.
⑧
⑨
①
②
③
dial drum: fully counterclockwise position
tuning shaft

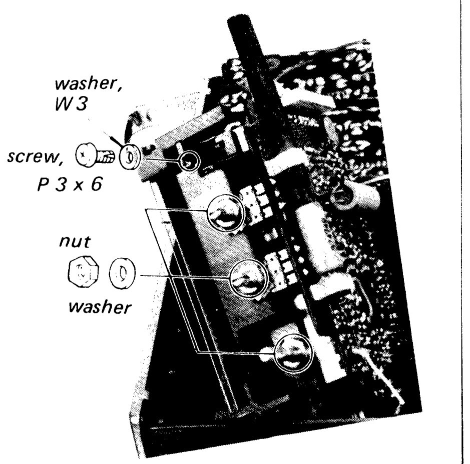
AM IF ALIGNMENT

Radio Circuit Board Removal

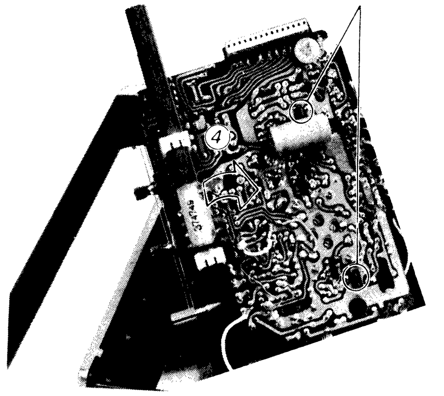
① Retain the dial drum with cellophane tape or an equivalent tape to hold the dial cord stringing.



② Remove the screw, nuts and washers.


washer, W3
screw, P 3 x 6
nut
washer

③ Release the two claws of chassis from the circuit board.

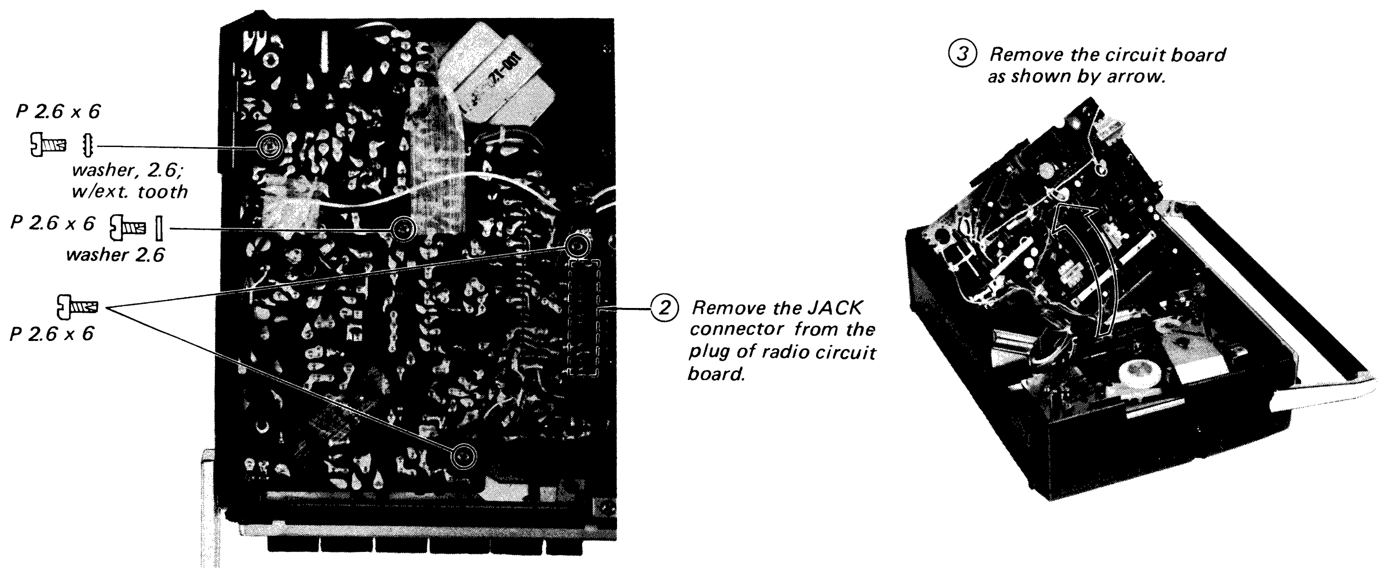


Note: When removing the circuit board, remove the tuning shaft from dial drum to keep the dial cord stringing.

SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY

Audio Circuit Board Removal


P 2.6 x 6
washer, 2.6; w/ext. tooth
P 2.6 x 6
washer 2.6
P 2.6 x 6

① Remove the four screws and two washers.

② Remove the JACK connector from the plug of radio circuit board.

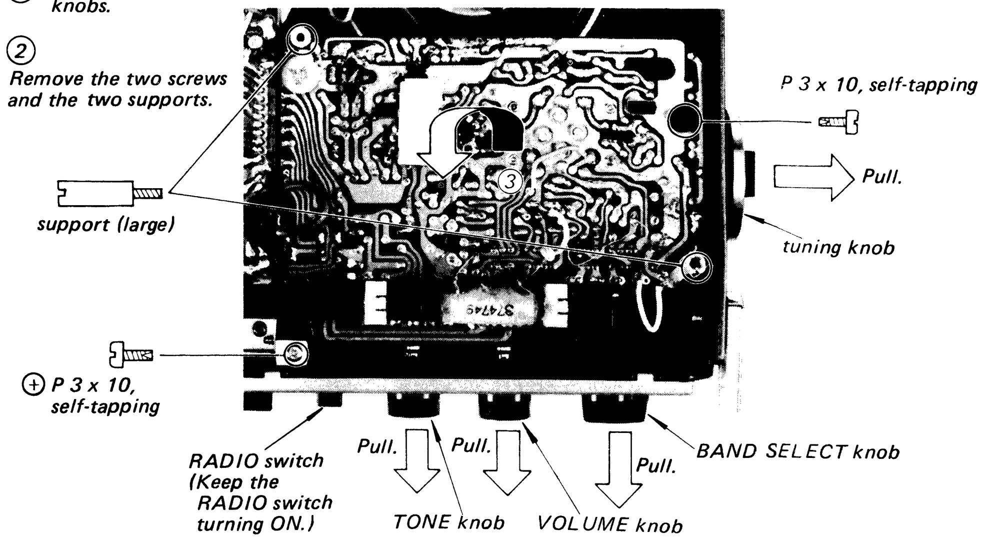
③ Remove the circuit board as shown by arrow.

Electrical Adjustments for FM Section

Radio Chassis Removal

① Pull off the four knobs.

② Remove the two screws and the two supports.

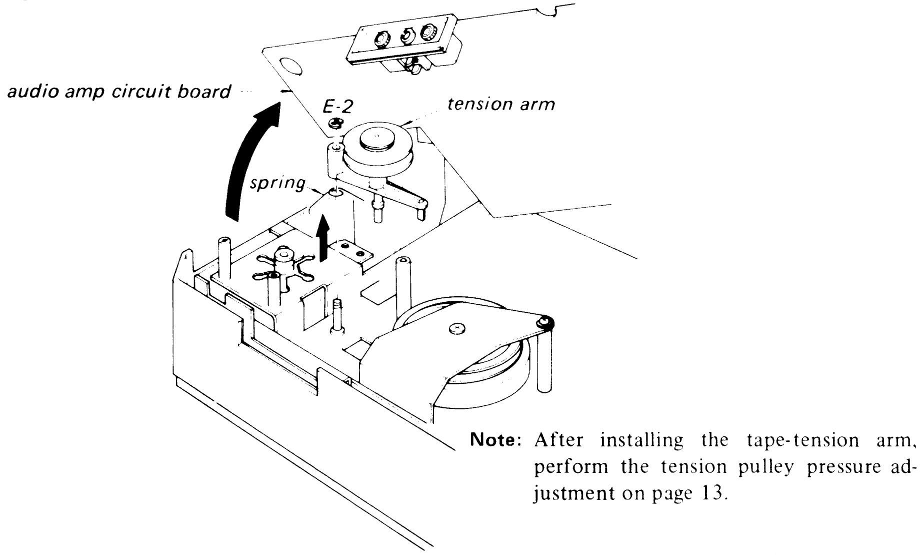

③
P 3 x 10, self-tapping
Pull.
support (large)
tuning knob
⊕ P 3 x 10, self-tapping
RADIO switch (Keep the RADIO switch turning ON.)
Pull.
Pull.
Pull.
BAND SELECT knob
TONE knob
VOLUME knob

Rear Case Removal

Remove the five screws of rear case.
(B 3 x 10, black)

Tension Arm Removal

① Remove the one retaining ring (E-2).


audio amp circuit board
E-2
tension arm
spring

Note: After installing the tape-tension arm, perform the tension pulley pressure adjustment on page 13.

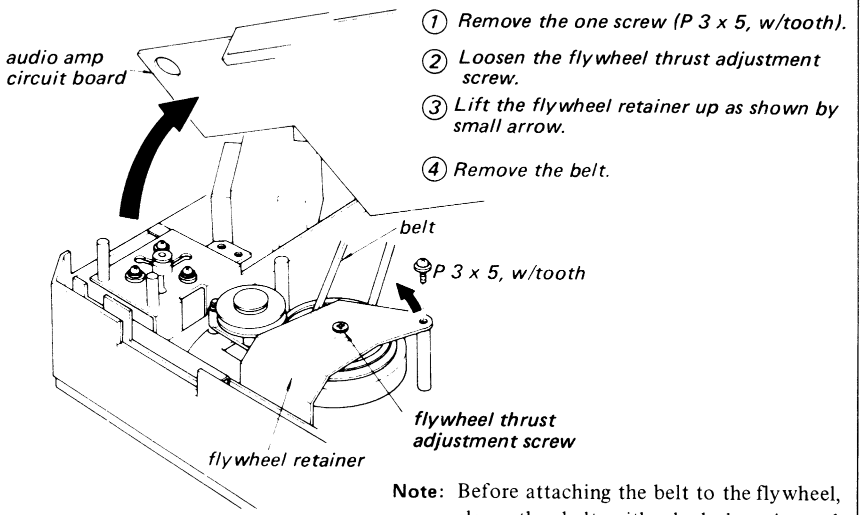
Belt Removal

① Remove the one screw (P 3 x 5, w/tooth).

② Loosen the flywheel thrust adjustment screw.

③ Lift the flywheel retainer up as shown by small arrow.

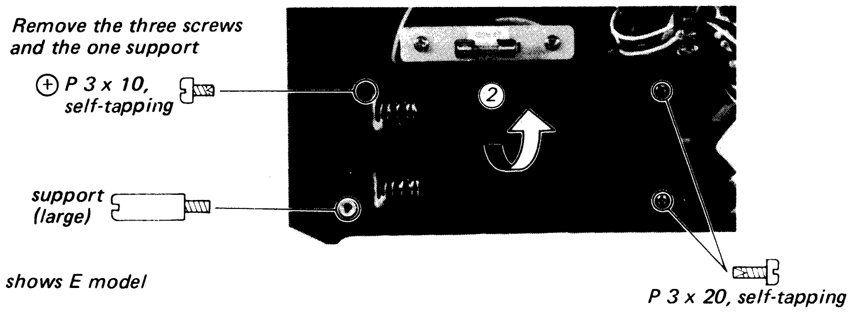
④ Remove the belt.


audio amp circuit board
belt
P 3 x 5, w/tooth
flywheel thrust adjustment screw
flywheel retainer

Note: Before attaching the belt to the flywheel, clean the belt with alcohol moistened swab.

Battery Case Removal

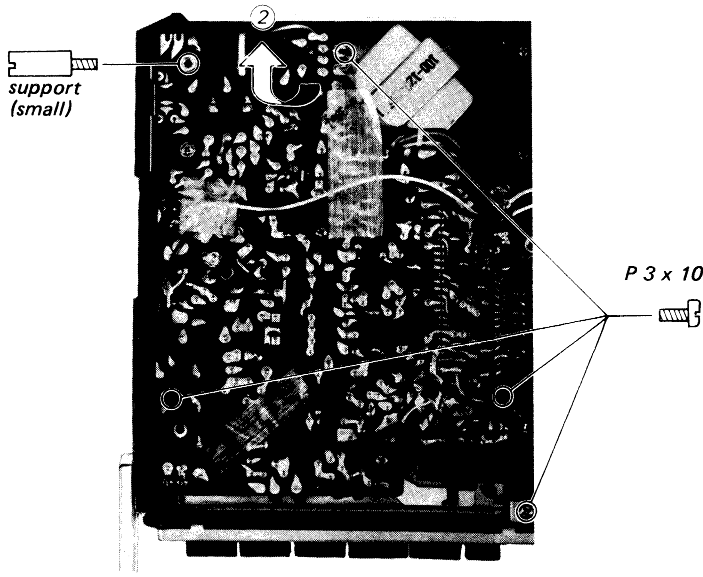
① Remove the three screws and the one support


⊕ P 3 x 10, self-tapping
②
support (large)
P 3 x 20, self-tapping

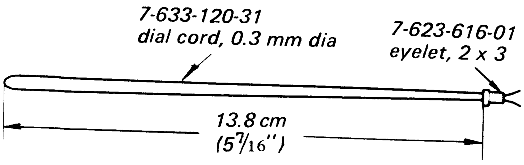
Phote shows E model

Chassis Removal

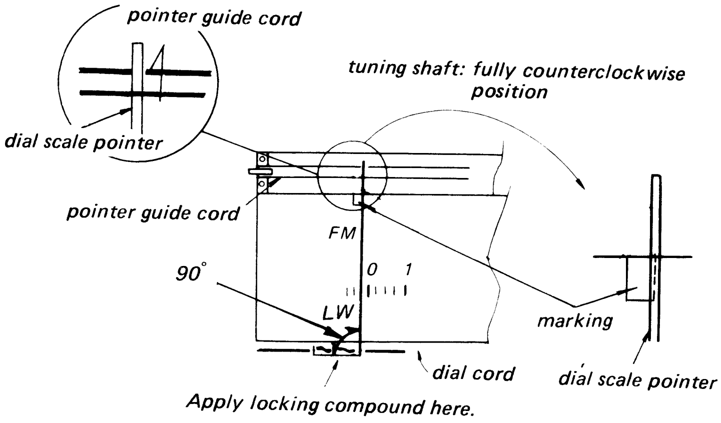
① Remove the four screws and one support


②
support (small)
P 3 x 10

3) Pointer Guide Assembly


7-633-120-31
dial cord, 0.3 mm dia
7-623-616-01
eyelet, 2 x 3
13.8 cm
(5 7/16")

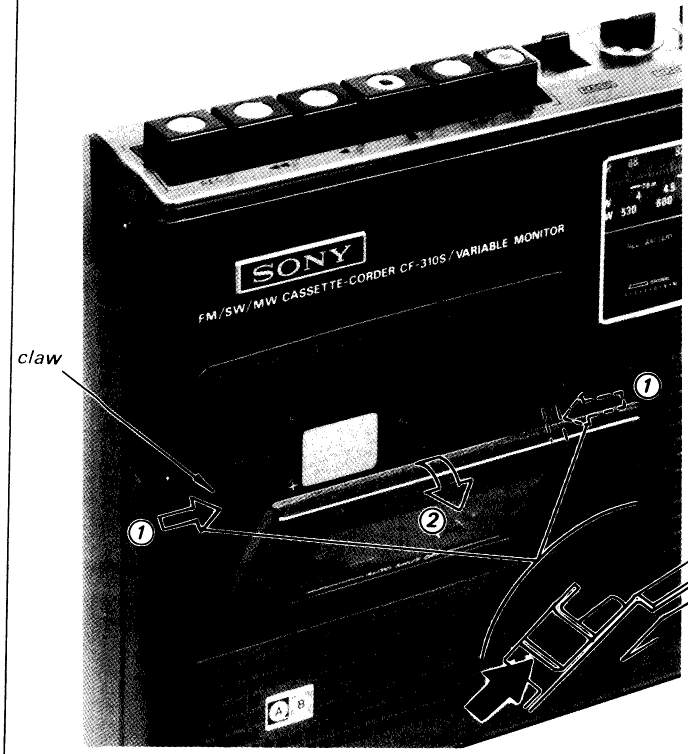
4) Dial Scale Pointer Setting


pointer guide cord
tuning shaft: fully counterclockwise position
dial scale pointer
pointer guide cord
FM
0 1
90°
LW
marking
dial cord
dial scale pointer
Apply locking compound here.

CASSETTE HOLDER REMOVAL

① *Push two claws simultaneously as shown by the arrow ①.*

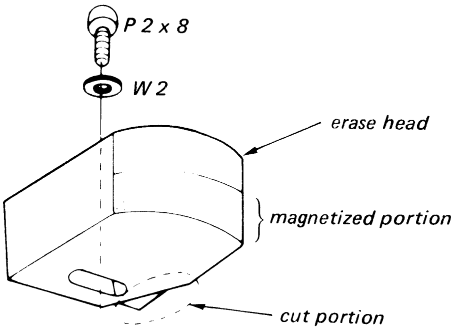
② *Remove cassette holder as shown by the arrow ②.*


claw
①
①
②
SONY
FM/SW/MW CASSETTE-CORDER CF-310S/VARIABLE MONITOR

2-2. ATTACHMENTS

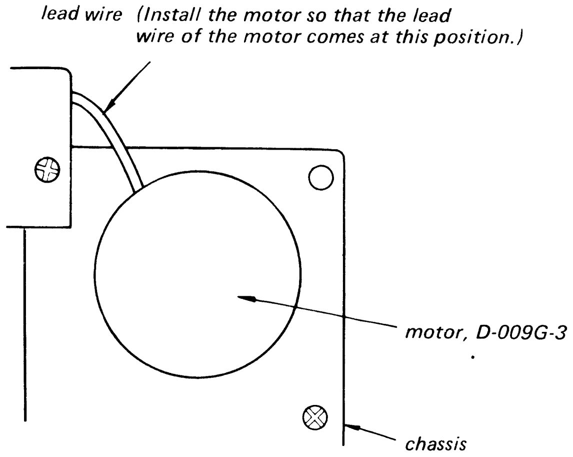
2-2-1. ERASE HEAD ATTACHMENT

Attach the erase head so that cut portion comes lower side.


P 2 x 8
W 2
erase head
magnetized portion
cut portion

2-2-2. MOTOR ATTACHMENT

D-009G-3


lead wire (Install the motor so that the lead wire of the motor comes at this position.)
motor, D-009G-3
chassis

SECTION 3

ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENT

Fast Forward and Rewind Torque Adjustment

Before the adjustment, clean the contact portion between the reel spindle and the idler with alcohol moistened swab.

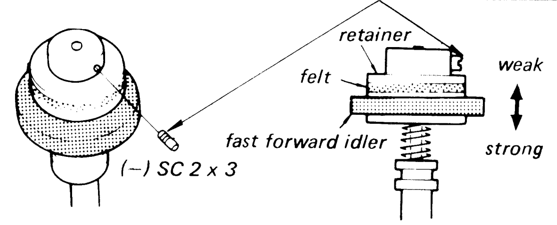
Torque meter	Meter reading
* CQ-201	55 ~ 95 g·cm (0.77 ~ 1.33 oz·inch)
Ordinary torque meter	60 ~ 100 g·cm (0.84 ~ 1.39 oz·inch)

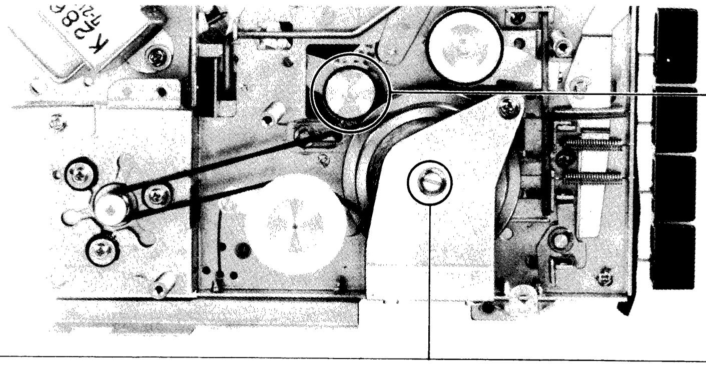
* SONY cassette type torque meter

Model	Part No.
CQ-201	Y-20926-11-1

If necessary, adjust as follows:

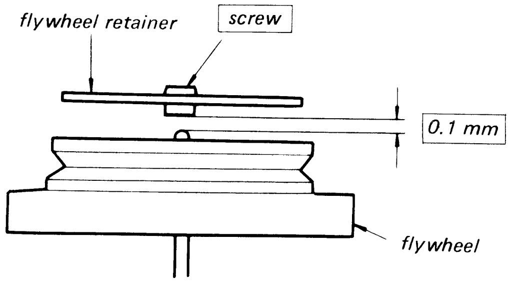
1. *Remove the locking compound.*
2. *Loosen the set screw and adjust the retainer position.*


retainer
felt
weak
strong
fast forward idler
(−) SC 2 x 3



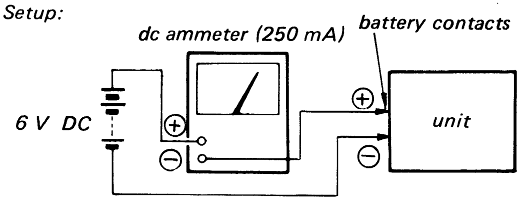
Flywheel Thrust Play Adjustment

– playback mode –


flywheel retainer
screw
0.1 mm
flywheel

Note: 1. Wider clearance causes increase of wow and flutter.
2. Narrower clearance causes increase of current drain. The battery's life is shortened.

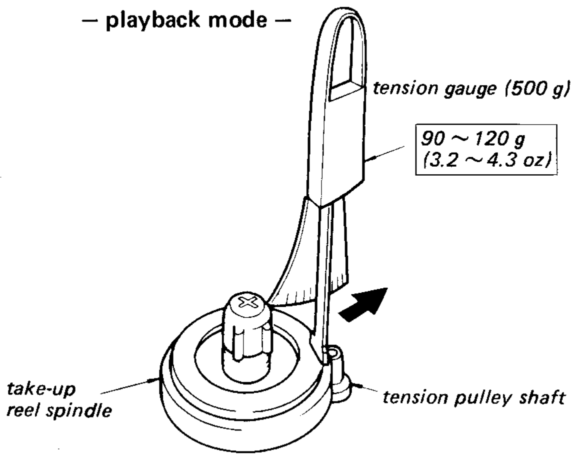
1. *Setup:*


dc ammeter (250 mA)
battery contacts
6 V DC
⊕
⊖
⊕
⊖
unit

2. *Place the unit horizontally with the flywheel side up.*
3. *Loosen the thrust screw for the sufficient flywheel play.*
4. *Tighten the screw until current suddenly increases, then loosen the screw 60 degrees.*
5. *Apply the locking compound to the screw.*

Tension Pulley Pressure Adjustment

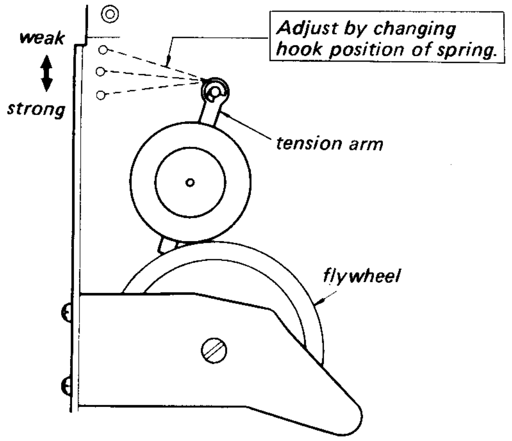
– playback mode –


tension gauge (500 g)
90 ~ 120 g
(3.2 ~ 4.3 oz)
take-up reel spindle
tension pulley shaft

Push the tension pulley shaft away from the take-up reel spindle using a tension gauge, as shown by the arrow. Make the tension pulley return to the take-up reel spindle slowly. The pressure should be measured at the point where the tension pulley shaft just contacts the take-up reel spindle.

Note: Stronger or weaker pressure of the tension pulley shaft causes poor take-up torque in playback mode.

If necessary, adjust as follows:


weak
strong
Adjust by changing hook position of spring.
tension arm
flywheel

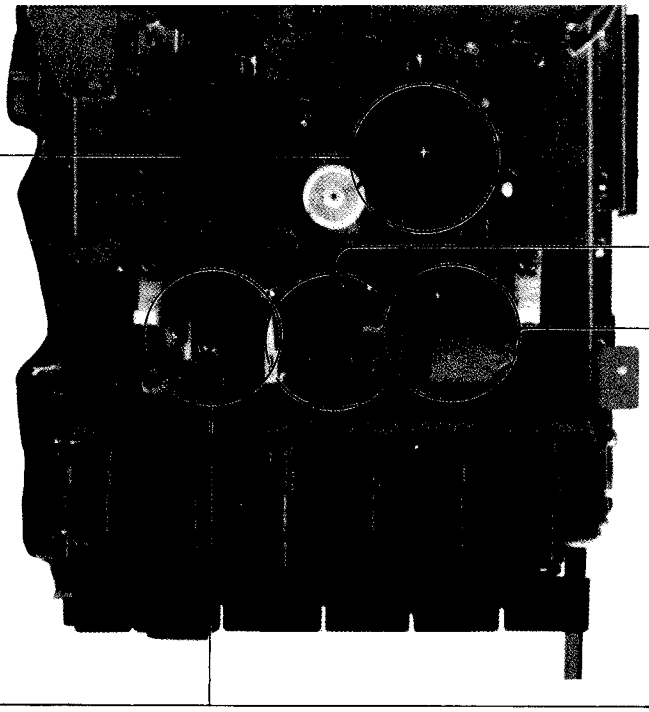
Playback Torque Measurement

Before the adjustment, clean the contact portion between the reel spindle and the tension pulley with alcohol moistened swab.

Torque meter	Meter reading
* CQ-101	25 ~ 45 g·cm (0.35 ~ 0.62 oz·inch)
Ordinary torque meter	35 ~ 55 g·cm (0.49 ~ 0.77 oz·inch)

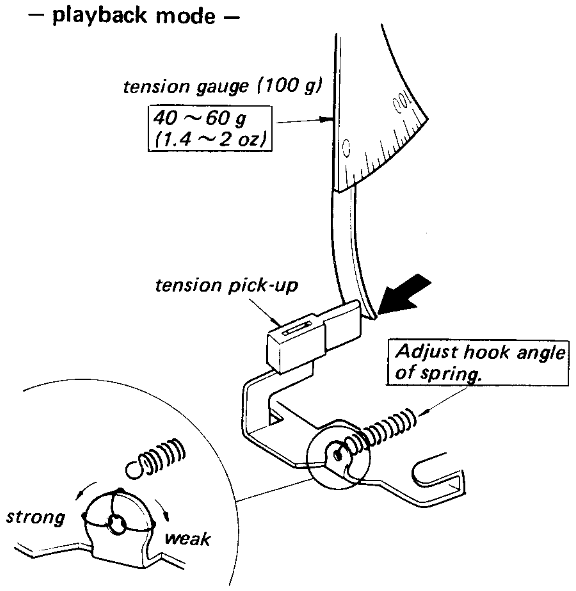
* SONY cassette type torque meter

Model	Part No.
CQ-101	Y-20926-01-1



Tension Pick-up Adjustment

– playback mode –

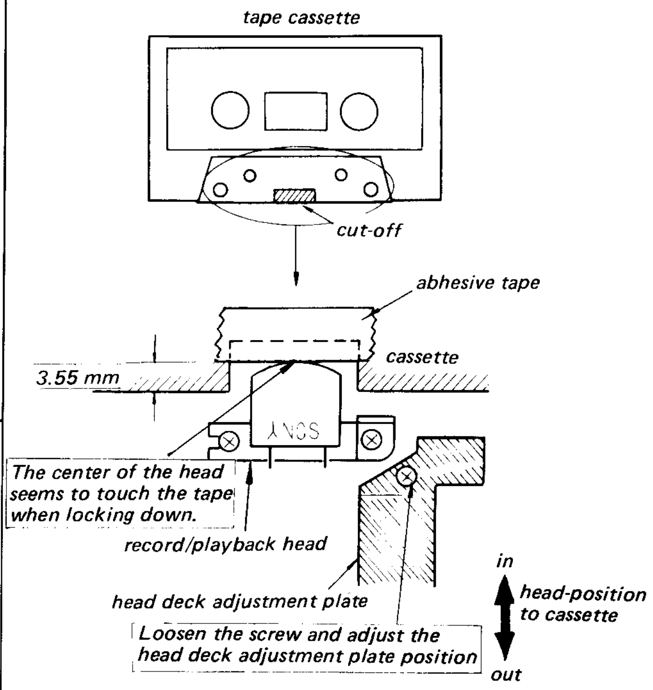

tension gauge (100 g)
40 ~ 60 g
(1.4 ~ 2 oz)
tension pick-up
Adjust hook angle of spring.
strong
weak

The pressure should be measured just when the tension pick-up starts to move.

Note:
1. If the pressure of the tension pick-up is weak, the shut-off mechanism will be operated during the tape travel.
2. If the pressure is strong, the mechanism does not operate even if the tape travel is finished.
3. After the adjustment, apply the locking compound to the hook of spring.

Head Deck Position Adjustment

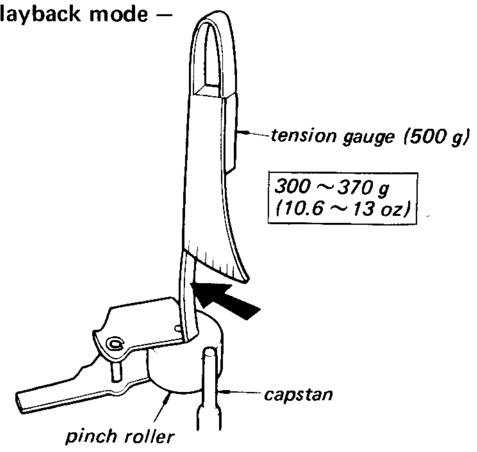
– playback mode –


tape cassette
cut-off
abhesive tape
cassette
3.55 mm
SONY
The center of the head seems to touch the tape when locking down.
record/playback head
head deck adjustment plate
Loosen the screw and adjust the head deck adjustment plate position
in
head-position to cassette
out

Note:
1. If the center of the head is less than 3.55 mm into the cassette, the following troubles occur:
   1) The tape does not perfectly contact the head.
   2) The shut-off mechanism may not operate because the tape can not push the tension pick-up strongly enough to operate the shut-off mechanism.
2. After the adjustment, apply the locking compound to the screw.

Pinch Roller Pressure Measurement

– playback mode –


tension gauge (500 g)
300 ~ 370 g
(10.6 ~ 13 oz)
capstan
pinch roller

Push the pinch roller away from the capstan using a tension gauge as shown by the arrow. Make the pinch roller return to the capstan slowly. The pressure should be measured at the point where the pinch roller just contacts the capstan.

Note:
1. Weaker pressure causes increase of wow and flutter.
2. Stronger pressure causes increase of current drain.

3-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with alcohol moistened swab:
   Record/playback head
   Erase head
   Capstan
   Pinch roller
   Rubber belts
   Idlers
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring a head demagnetizer close to the erase head, and do not use the magnetized screwdriver for adjusting).
3. After the adjustments, apply locking compound to the adjusted parts.
4. The adjustments should be performed in the order listed in this service manual.
5. The adjustments should be performed with rated power supply voltage unless otherwise specified.

TAPE RECORDER SECTION

Test Equipment/Tools Required

audio oscillator (af osc)
VTVM
resistors 600 Ω, 10 kΩ
digital frequency counter
or speed checker (SONY LFM-30)
attenuator (600 Ω)
SONY test tapes
  P-4-A81 (6.3 kHz, −10 dB)
  P-4-L81 (333 Hz, 0 dB)
  SPC-4 (1 kHz, 0 dB)
  WS-48 (3 kHz, 0 dB)
blank tape cassette (completely erased)
  SONY CS-10
wow meter

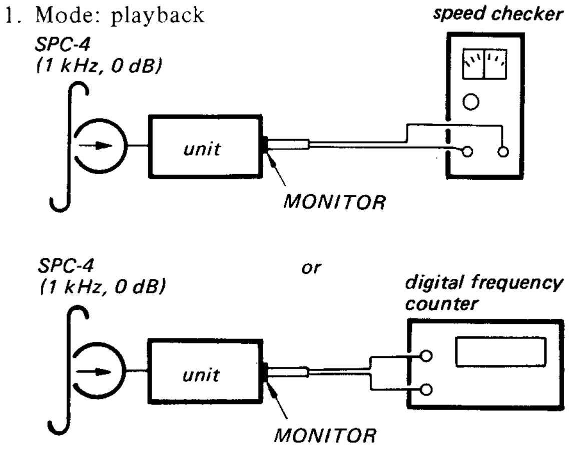
1. Tape Speed Adjustment

Settings:

RADIO switch:	OFF
VOLUME control:	mechanical mid
Power source:	6 V DC

Procedure:

1. Mode: playback

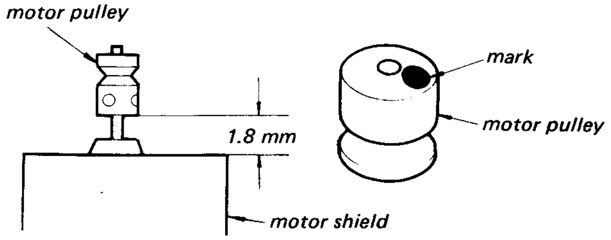

SPC-4
(1 kHz, 0 dB)
unit
MONITOR
speed checker
SPC-4
(1 kHz, 0 dB)
or
unit
MONITOR
digital frequency counter

Specification:

speed checker	digital frequency counter
−3 ∼ + 3 %	970 ∼ 1,030 Hz

Difference between beginning and end of tape should be within 1 % (10 Hz).

2. If necessary, replace motor pulley.


motor pulley
1.8 mm
motor shield
mark
motor pulley

Part No.	Mark	Diameter	Speed
3-581-327-11	red	10.8 mm	faster ↕ slower
3-581-327-01	none	10.7 mm	
3-581-327-21	black	10.6 mm	

Note: When replacing the belt, install it without twist. If not, wow and flutter may increase.

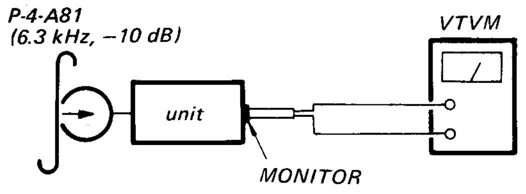
2. Record/playback Head Azimuth Adjustment

Settings:

RADIO switch:	OFF
TONE control:	HIGH
VOLUME control:	mechanical mid

Procedure:

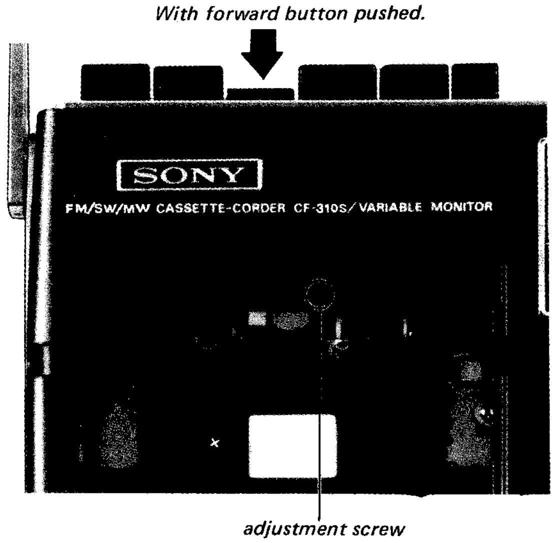
1. Mode: playback


P-4-A81
(6.3 kHz, −10 dB)
unit
MONITOR
VTVM

2. Turn the adjustment screw for the highest VTVM reading.

   Note: Several peaks may appear, take the highest.

Adjustment Location:


With forward button pushed.
SONY
FM/SW/MW CASSETTE-CORDER CF-310S/VARIABLE MONITOR
adjustment screw

Note: Remove the cassette holder for azimuth adjustment. (See Page 9).

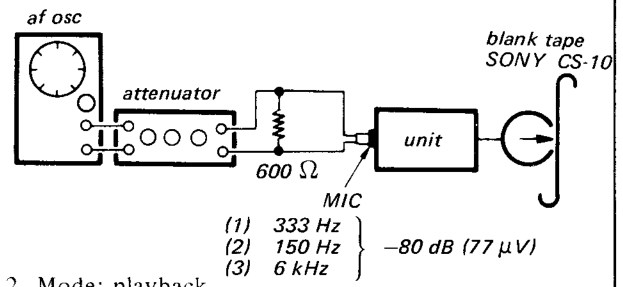
3. Record Bias Adjustment

Settings:

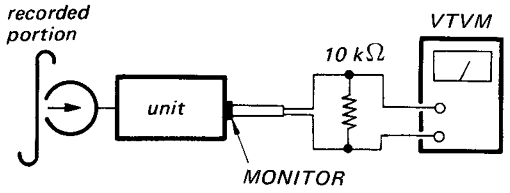
RADIO switch:	OFF
TONE control:	mechanical mid

Procedure:

1. Mode: record

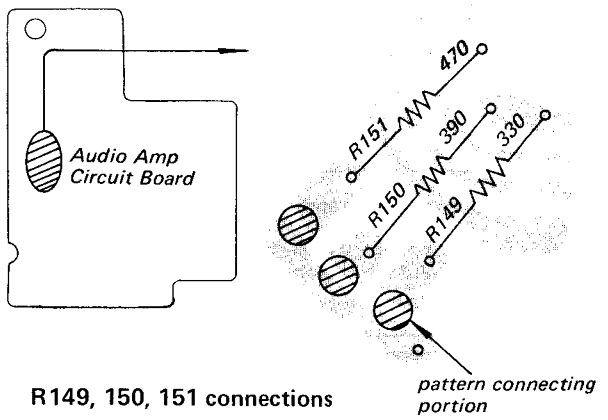

af osc
attenuator
600 Ω
MIC
unit
blank tape
SONY CS-10
(1) 333 Hz
(2) 150 Hz
(3) 6 kHz
−80 dB (77 µV)

2. Mode: playback


recorded portion
unit
MONITOR
10 kΩ
VTVM

Recorded signal	VTVM reading
333 Hz	Adjust VOLUME control for −10 dB (0.25 V)
150 Hz	6 dB allowable range 150 Hz 333 Hz 6 kHz
6 kHz	

If necessary, adjust by changing the pattern connection.


Audio Amp
Circuit Board
R151
470
R150
390
R149
330
pattern connecting portion

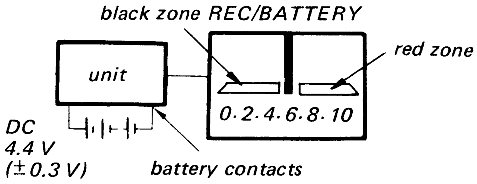
R149, 150, 151 connections

Connect	Resistance value (Ω)	6 kHz level
R149	330	decrease ↕ increase
R150	390	
R151	470	

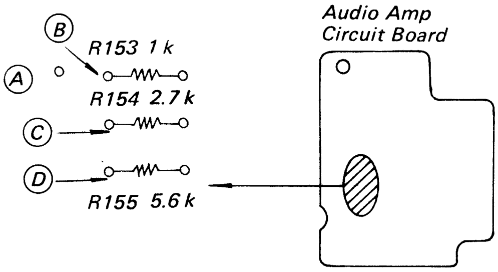
4. REC/BATTERY Meter Check

Settings:

RADIO switch:	ON
VOLUME control:	MIN
Power Source:	4.4 V DC (± 0.3 V)


black zone REC/BATTERY
red zone
unit
0·2·4·6·8·10
DC
4.4 V
(± 0.3 V)
battery contacts

1. Mode: playback
   Select the resistance value by changing pattern connection to place the pointer of REC/BATTERY meter at center as shown above.


B
A
R153 1 k
R154 2.7 k
C
D
R155 5.6 k
Audio Amp
Circuit Board

Pattern Connections

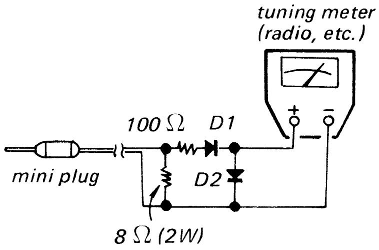
① A-B, A-C, A-D = 642 Ω
② A-B, A-C = 729 Ω
③ A-B, A-D = 848 Ω
④ A-B = 1 kΩ (standard)
⑤ A-C, A-D = 1.82 kΩ
⑥ A-C = 2.7 kΩ
⑦ A-D = 5.6 kΩ

RADIO SECTION

Test Equipment/Tools Required:

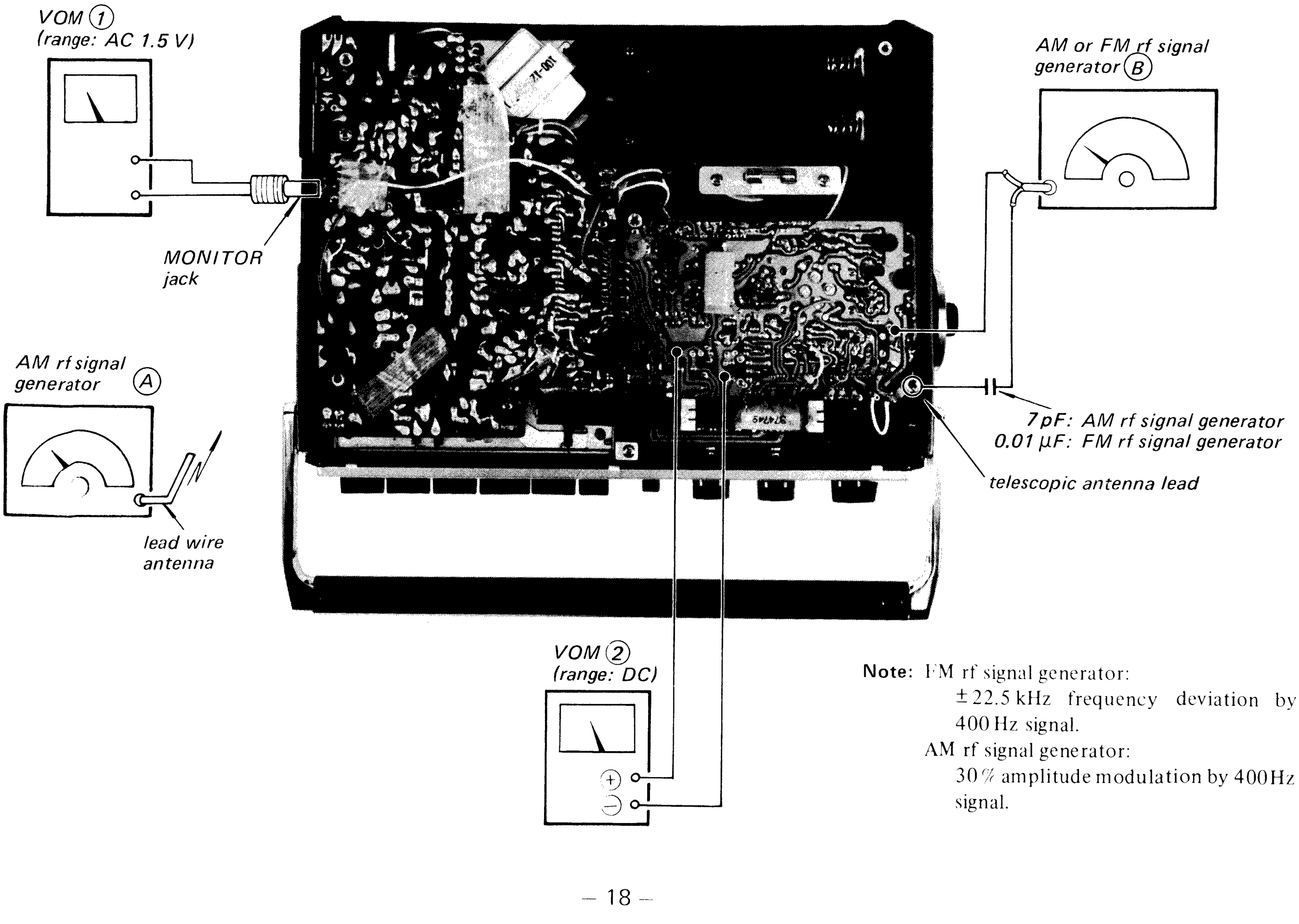
AM rf signal generator
FM rf signal generator
VOM
lead wire antenna
8 Ω, 2 W resistor

Note: Instead of VOM (range: 0.5 ∼ 5 V AC), a simple test equipment shown below can be used.


tuning meter
(radio, etc.)
+
−
100 Ω
D1
D2
mini plug
8 Ω (2W)

D1, D2: germanium diode or power germanium transistor (2SB495, etc.)

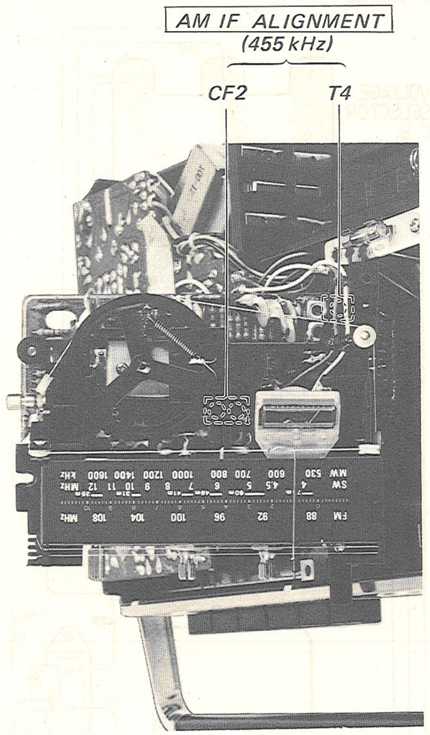
Test Setup

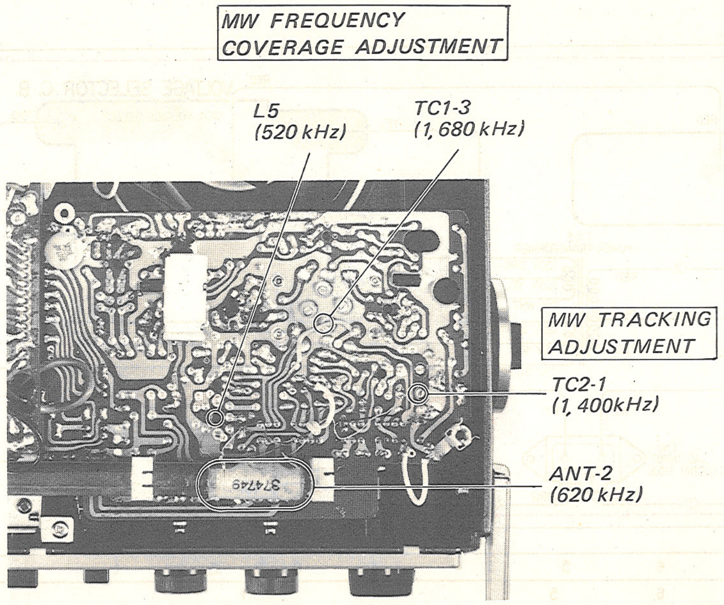

VOM ①
(range: AC 1.5 V)
MONITOR
jack
AM rf signal
generator Ⓐ
lead wire
antenna
AM or FM rf signal
generator Ⓑ
7 pF: AM rf signal generator
0.01 μF: FM rf signal generator
telescopic antenna lead
VOM ②
(range: DC)
+
−

Note: FM rf signal generator:
±22.5 kHz frequency deviation by 400 Hz signal.
AM rf signal generator:
30 % amplitude modulation by 400 Hz signal.

MW, AM IF

AM rf signal generator connection Ⓐ .


AM IF ALIGNMENT
(455 kHz)
CF2
T4

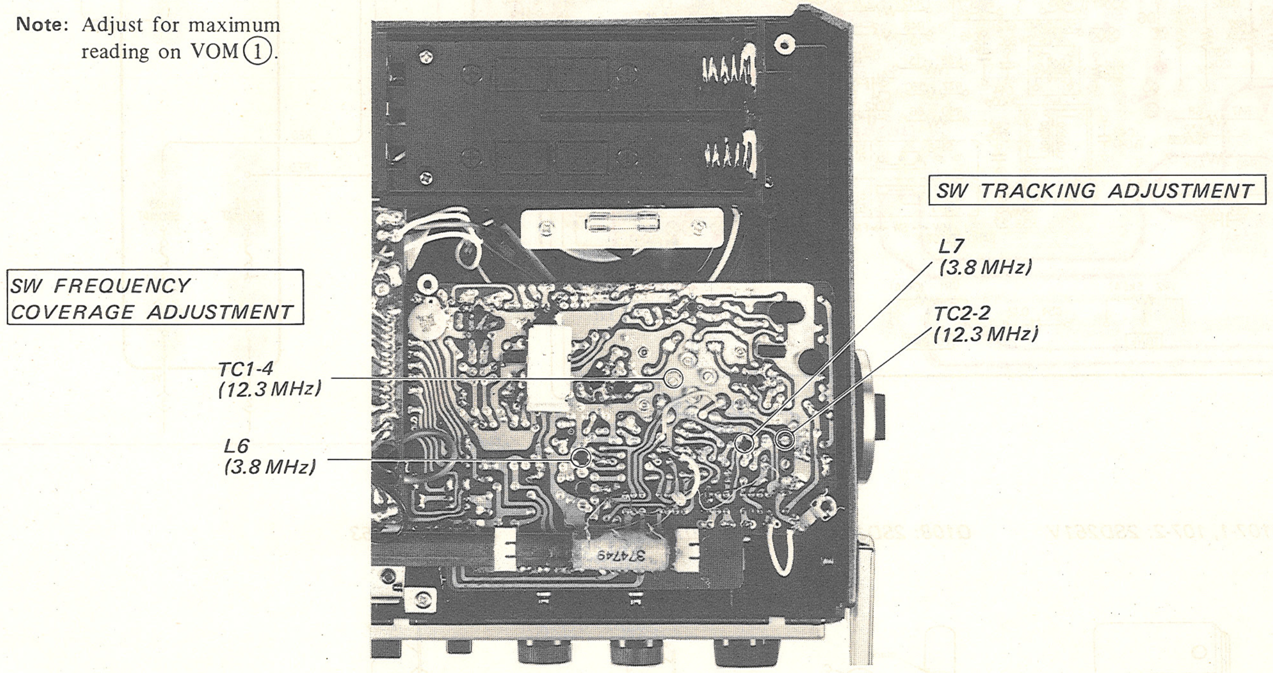

MW FREQUENCY COVERAGE ADJUSTMENT
L5
(520 kHz)
TC1-3
(1,680 kHz)
MW TRACKING ADJUSTMENT
TC2-1
(1,400kHz)
ANT-2
(620 kHz)

Note: 1. Adjust for maximum reading on VOM ①.
2. After the adjustments fix the coil ANT-2 with wax.

SW

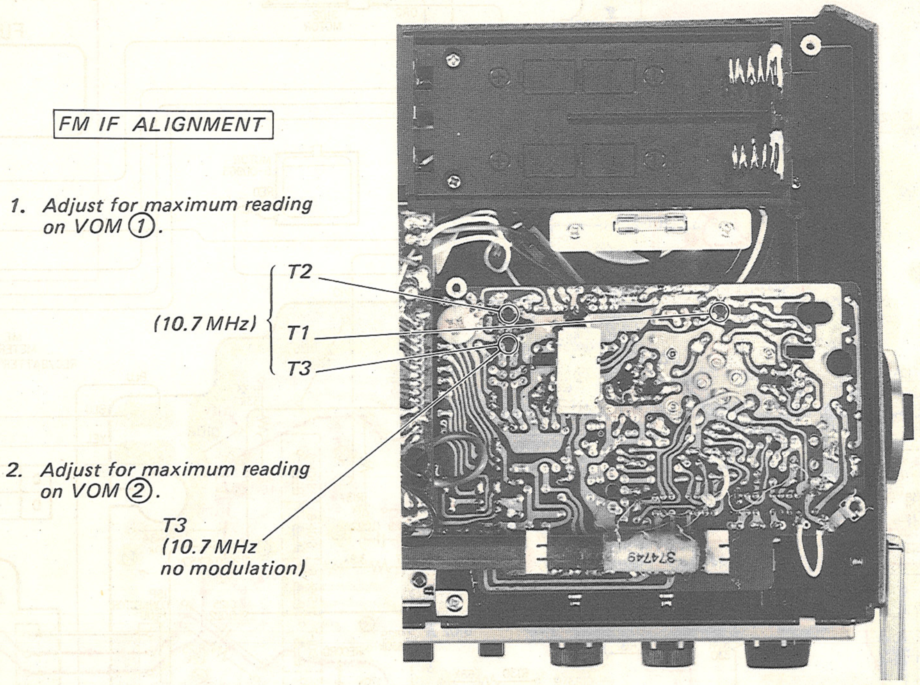
AM rf signal generator connection Ⓑ .

Note: Adjust for maximum reading on VOM ①.


SW TRACKING ADJUSTMENT
SW FREQUENCY COVERAGE ADJUSTMENT
L7
(3.8 MHz)
TC2-2
(12.3 MHz)
TC1-4
(12.3 MHz)
L6
(3.8 MHz)

FM IF

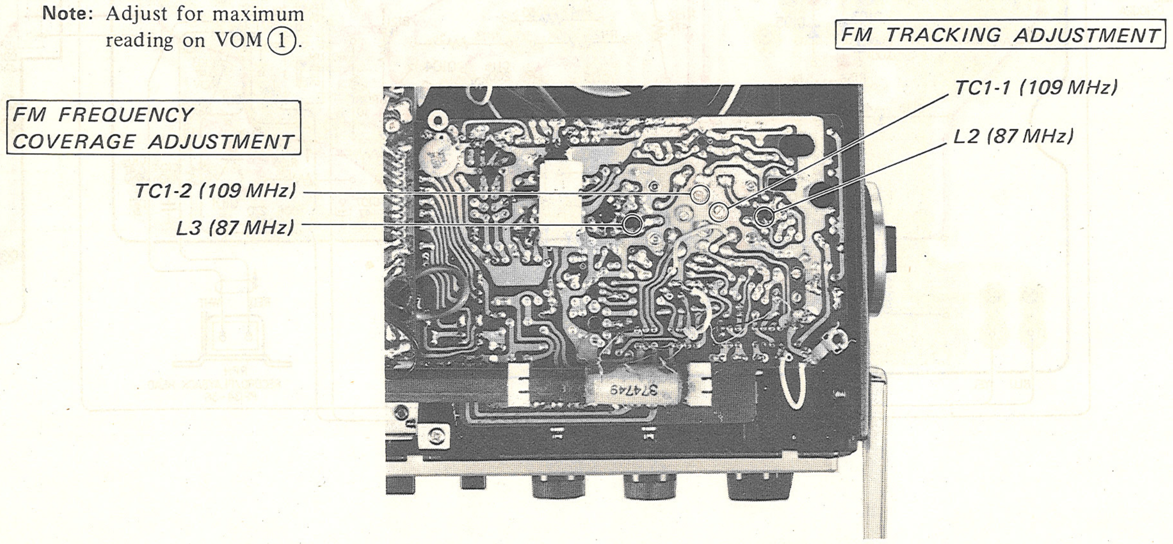
FM rf signal generator connection Ⓑ .


FM IF ALIGNMENT
1. Adjust for maximum reading on VOM ①.
T2
(10.7 MHz)
T1
T3
2. Adjust for maximum reading on VOM ②.
T3
(10.7 MHz
no modulation)

FM

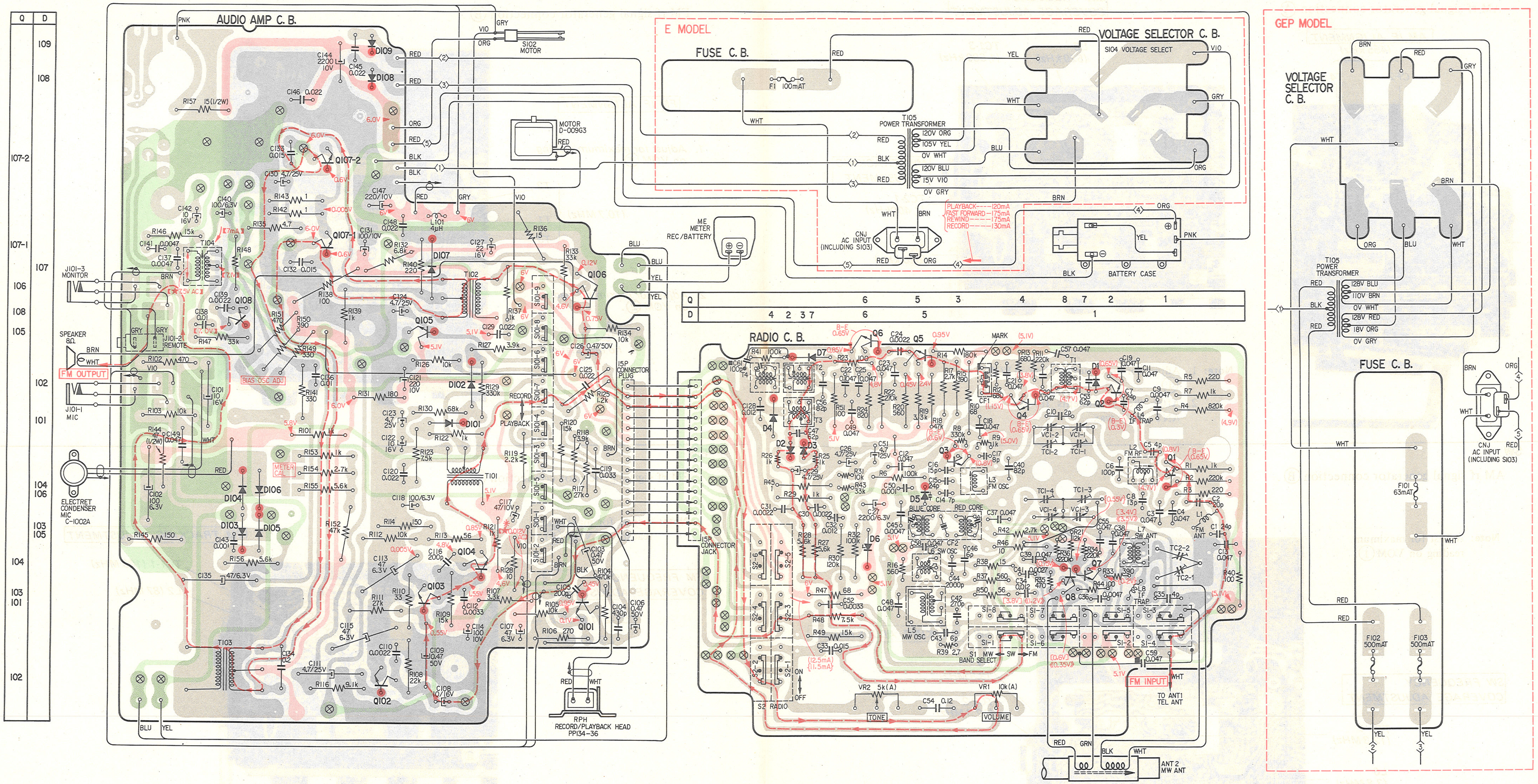
FM rf signal generator connection Ⓑ .

Note: Adjust for maximum reading on VOM ①.


FM TRACKING ADJUSTMENT
TC1-1 (109 MHz)
L2 (87 MHz)
FM FREQUENCY COVERAGE ADJUSTMENT
TC1-2 (109 MHz)
L3 (87 MHz)

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM
— Conductor Side —


Q
D
AUDIO AMP C. B.
E MODEL
FUSE C. B.
VOLTAGE SELECTOR C. B.
S104 VOLTAGE SELECT
GEP MODEL
VOLTAGE SELECTOR C. B.
T105 POWER TRANSFORMER
CNJ AC INPUT (INCLUDING S103)
PLAYBACK——120mA
FAST FORWARD—175mA
REWIND——175mA
RECORD——130mA
BATTERY CASE
ME METER REC/BATTERY
S102 MOTOR
MOTOR D-009G3
J101-3 MONITOR
SPEAKER 8Ω
FM OUTPUT
J101-2 REMOTE
J101-1 MIC
ELECTRET CONDENSER MIC C-1002A
BIAS OSC ADJ
METER CAL
15P CONNECTOR PLUG
15P CONNECTOR JACK
RADIO C. B.
FUSE C. B.
RPH RECORD/PLAYBACK HEAD PP134-36
S2 RADIO
VR2 5k(A) TONE
VR1 10k(A) VOLUME
S1 MW ← SW → FM BAND SELECT
FM INPUT
TO ANT1 TEL ANT
ANT 2 MW ANT
F101 63mAT
F102 500mAT
F103 500mAT

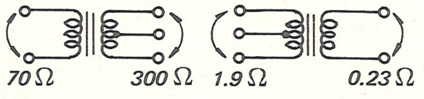
Note:

- 🟥 : B+ pattern
- 🟩 : printed jumper conductor
- ←--- : FM signal path

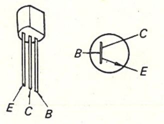
● DC RESISTANCE

Resistances are out-of-circuit values.

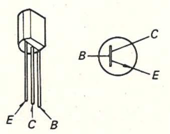
T101, 102 T103


70Ω
300Ω
1.9Ω
0.23Ω

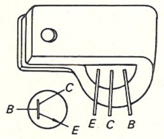
Q1, 8: 2SC839J
Q2, 4, 5, 7: 2SC839F
Q3, 6: 2SC839H
Q101: 2SC900E



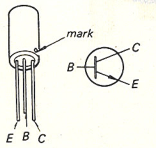
Q102, 103: 2SC945P
Q104 ~ 106: 2SC945Q



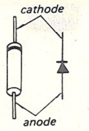
Q107-1, 107-2: 2SD261V



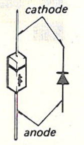
Q108: 2SD187


mark
B
C
E
E B C

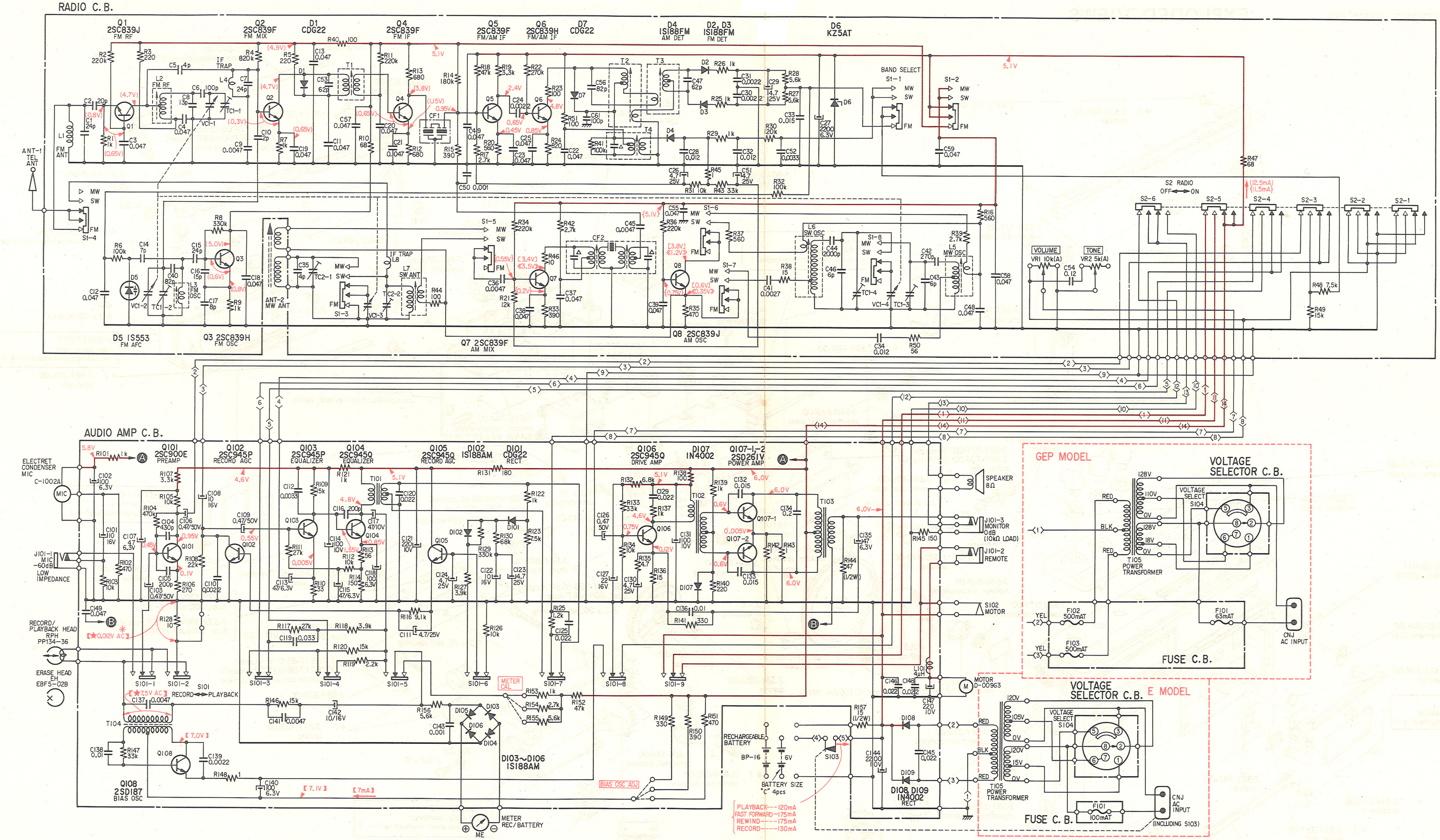
D1, 7, 101: CDG22
D2 ~ 4: 1S188FM
D6: KZ5AT
D102 ~ 106: 1S188AM
D107 ~ 109: 1N4002


cathode
anode

D5: 1S553


cathode
anode

4-2. SCHEMATIC DIAGRAM


RADIO C.B.
Q1 2SC839J FM RF
Q2 2SC839F FM MIX
D1 CDG22
Q4 2SC839F FM IF
Q5 2SC839F FM/AM IF
Q6 2SC839H FM/AM IF
D7 CDG22
D4 IS188FM AM DET
D2, D3 IS188FM FM DET
D6 KZ5AT
BAND SELECT
S2 RADIO OFF ON
VOLUME VR1 10k(A)
TONE VR2 5k(A)
D5 IS553 FM AFC
Q3 2SC839H FM OSC
Q7 2SC839F AM MIX
Q8 2SC839J AM OSC
ANT-1 TEL ANT
ANT-2 MW ANT
AUDIO AMP C.B.
Q101 2SC900E PREAMP
Q102 2SC945P RECORD AGC
Q103 2SC945P EQUALIZER
Q104 2SC945Q EQUALIZER
Q105 2SC945Q RECORD AGC
D102 IS188AM
D101 CDG22 RECT
Q106 2SC945Q DRIVE AMP
D107 IN4002
Q107-1, -2 2SD261V POWER AMP
ELECTRET CONDENSER MIC C-1002A
J101-1 MIC -60dB LOW IMPEDANCE
RECORD/PLAYBACK HEAD RPH PP134-36
ERASE HEAD EH EBF5-02B
Q108 2SD187 BIAS OSC
D103~D106 IS188AM
METER REC/BATTERY
ME
SPEAKER 8Ω
J101-3 MONITOR 0dB (10kΩ LOAD)
J101-2 REMOTE
S102 MOTOR
MOTOR D-0096S
RECHARGEABLE BATTERY BP-16
BATTERY SIZE "C" 4pcs
D108, D109 IN4002 RECT
PLAYBACK---120mA
FAST FORWARD—175mA
REWIND----175mA
RECORD----130mA
GEP MODEL
VOLTAGE SELECTOR C.B.
VOLTAGE SELECT S104
T105 POWER TRANSFORMER
FUSE C.B.
F101 63mAT
F102 500mAT
F103 500mAT
CNJ AC INPUT
E MODEL
F101 100mAT
(INCLUDING S103)
BIAS OSC ADJ
METER CAL

Note:

- C.B.: circuit board
- All capacitors are in μF unless otherwise noted. p = $\mu\mu$F
- All resistors are in Ω, ¼ W, unless otherwise noted. k = 1000
- △ indicates internal components.
- ⏚ indicates chassis ground.

- Voltages are DC with respect to ground unless otherwise noted. Readings taken under no-signal conditions with a VOM (20 kΩ/V). Readings in 【 】 are in record mode.

( ) : FM [ ] : SW

≪ ≫ : MW { } : SW and MW

Voltage variations may be noted due to normal production tolerances.

- Switch Mode

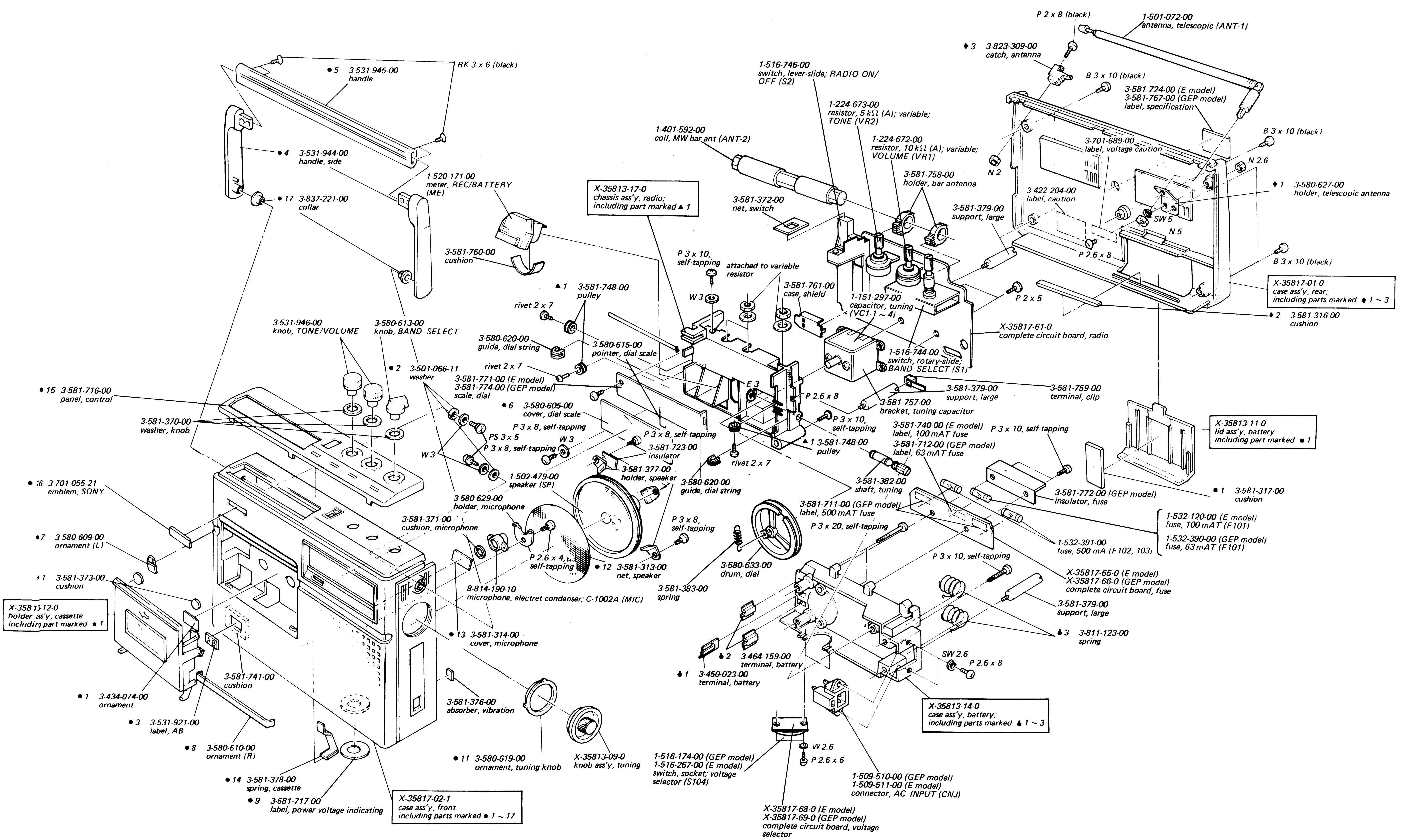
Ref. No.	Switch	Mode
S1	BAND SELECT FM/SW/MW	FM
S2	RADIO ON/OFF	OFF
S101	record/playback	playback
S102	motor	OFF
S103	AC/DC (included in CNJ)	DC
S104	voltage select	—

- * : When performing record level measurement, disconnect black wire across R128. After measurement, reconnect the wire.
- ⊕ : indicates through-hole
- ★ : AC voltage readings on bias oscillator circuit taken with a VTVM.
- ■ : mounted on conductor side.
- — : B+ circuit

SECTION 5

EXPLODED VIEWS

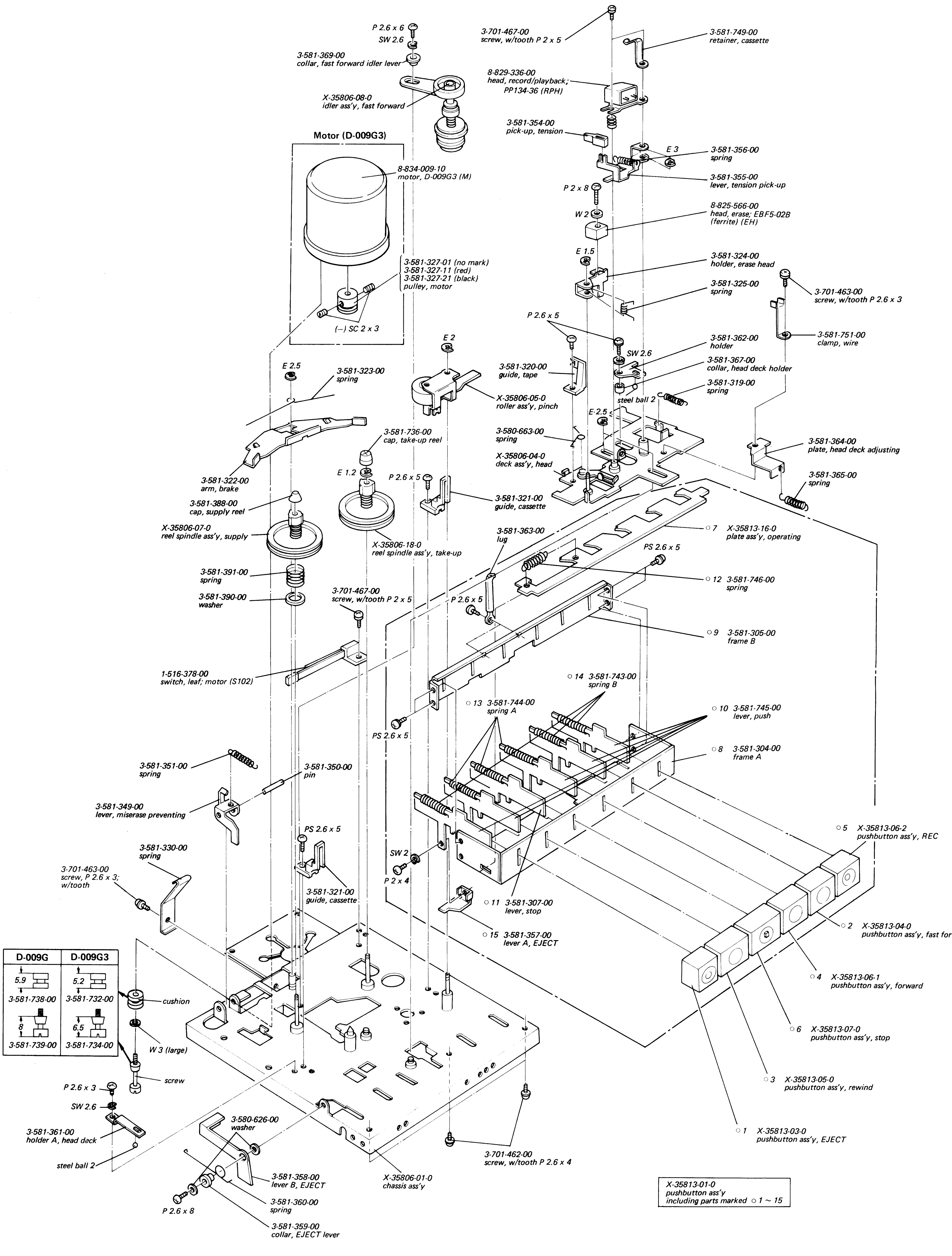
5-1. EXPLODED VIEW (1)


RK 3 x 6 (black)
● 5 3-531-945-00 handle
● 4 3-531-944-00 handle, side
● 17 3-837-221-00 collar
1-520-171-00 meter, REC/BATTERY (ME)
X-35813-17-0 chassis ass'y, radio; including part marked ▲ 1
3-581-760-00 cushion
▲ 1 3-581-748-00 pulley
rivet 2 x 7
3-580-620-00 guide, dial string
3-580-615-00 pointer, dial scale
3-531-946-00 knob, TONE/VOLUME
3-580-613-00 knob, BAND SELECT
● 2 3-501-066-11 washer
rivet 2 x 7
3-581-771-00 (E model)
3-581-774-00 (GEP model) scale, dial
● 15 3-581-716-00 panel, control
3-581-370-00 washer, knob
● 6 3-580-605-00 cover, dial scale
P 3 x 8, self-tapping
PS 3 x 5
W 3
P 3 x 8, self-tapping
W 3
1-502-479-00 speaker (SP)
3-580-629-00 holder, microphone
3-581-371-00 cushion, microphone
● 16 3-701-055-21 emblem, SONY
● 7 3-580-609-00 ornament (L)
★ 1 3-581-373-00 cushion
X-358 13-12-0 holder ass'y, cassette including part marked ★ 1
● 1 3-434-074-00 ornament
● 3 3-531-921-00 label, AB
3-581-741-00 cushion
● 8 3-580-610-00 ornament (R)
● 14 3-581-378-00 spring, cassette
● 9 3-581-717-00 label, power voltage indicating
X-35817-02-1 case ass'y, front including parts marked ● 1 ~ 17
● 13 3-581-314-00 cover, microphone
3-581-376-00 absorber, vibration
● 11 3-580-619-00 ornament, tuning knob
X-35813-09-0 knob ass'y, tuning
8-814-190-10 microphone, electret condenser; C-1002A (MIC)
P 2.6 x 4, self-tapping
● 12 3-581-313-00 net, speaker
3-581-377-00 holder, speaker
3-581-723-00 insulator
P 3 x 8, self-tapping
3-580-620-00 guide, dial string
P 3 x 8, self-tapping
3-581-383-00 spring
3-580-633-00 drum, dial
1-401-592-00 coil, MW bar ant (ANT-2)
3-581-372-00 net, switch
P 3 x 10, self-tapping
attached to variable resistor
W 3
3-581-761-00 case, shield
1-516-746-00 switch, lever-slide; RADIO ON/OFF (S2)
1-224-673-00 resistor, 5 kΩ (A); variable; TONE (VR2)
1-224-672-00 resistor, 10 kΩ (A); variable; VOLUME (VR1)
3-581-758-00 holder, bar antenna
1-151-297-00 capacitor, tuning (VC1-1 ~ 4)
1-516-744-00 switch, rotary-slide; BAND SELECT (S1)
E 3
P 2.6 x 8
3-581-757-00 bracket, tuning capacitor
P 3 x 10, self-tapping
▲ 1 3-581-748-00 pulley
rivet 2 x 7
3-581-379-00 support, large
3-581-382-00 shaft, tuning
3-581-711-00 (GEP model) label, 500 mAT fuse
P 3 x 20, self-tapping
3-581-740-00 (E model) label, 100 mAT fuse
3-581-712-00 (GEP model) label, 63 mAT fuse
P 3 x 10, self-tapping
3-581-772-00 (GEP model) insulator, fuse
1-532-391-00 fuse, 500 mA (F102, 103)
1-532-120-00 (E model) fuse, 100 mAT (F101)
1-532-390-00 (GEP model) fuse, 63 mAT (F101)
P 3 x 10, self-tapping
X-35817-65-0 (E model)
X-35817-66-0 (GEP model) complete circuit board, fuse
3-581-379-00 support, large
♠ 3 3-811-123-00 spring
SW 2.6
P 2.6 x 8
X-35813-14-0 case ass'y, battery; including parts marked ♠ 1 ~ 3
♠ 2 3-464-159-00 terminal, battery
♠ 1 3-450-023-00 terminal, battery
1-516-174-00 (GEP model)
1-516-267-00 (E model) switch, socket; voltage selector (S104)
W 2.6
P 2.6 x 6
1-509-510-00 (GEP model)
1-509-511-00 (E model) connector, AC INPUT (CNJ)
X-35817-68-0 (E model)
X-35817-69-0 (GEP model) complete circuit board, voltage selector
X-35817-61-0 complete circuit board, radio
3-581-379-00 support, large
3-581-759-00 terminal, clip
X-35813-11-0 lid ass'y, battery including part marked ■ 1
■ 1 3-581-317-00 cushion
P 2 x 8 (black)
1-501-072-00 antenna, telescopic (ANT-1)
♦ 3 3-823-309-00 catch, antenna
B 3 x 10 (black)
3-581-724-00 (E model)
3-581-767-00 (GEP model) label, specification
B 3 x 10 (black)
3-701-689-00 label, voltage caution
N 2
N 2.6
3-422-204-00 label, caution
♦ 1 3-580-627-00 holder, telescopic antenna
SW 5
N 5
3-581-379-00 support, large
P 2.6 x 8
B 3 x 10 (black)
P 2 x 5
X-35817-01-0 case ass'y, rear; including parts marked ♦ 1 ~ 3
♦ 2 3-581-316-00 cushion

Note:

- ○ Items without part number and description are not available.
- ○ All screws are Phillips (cross recess) type unless otherwise noted. (−) = slotted head

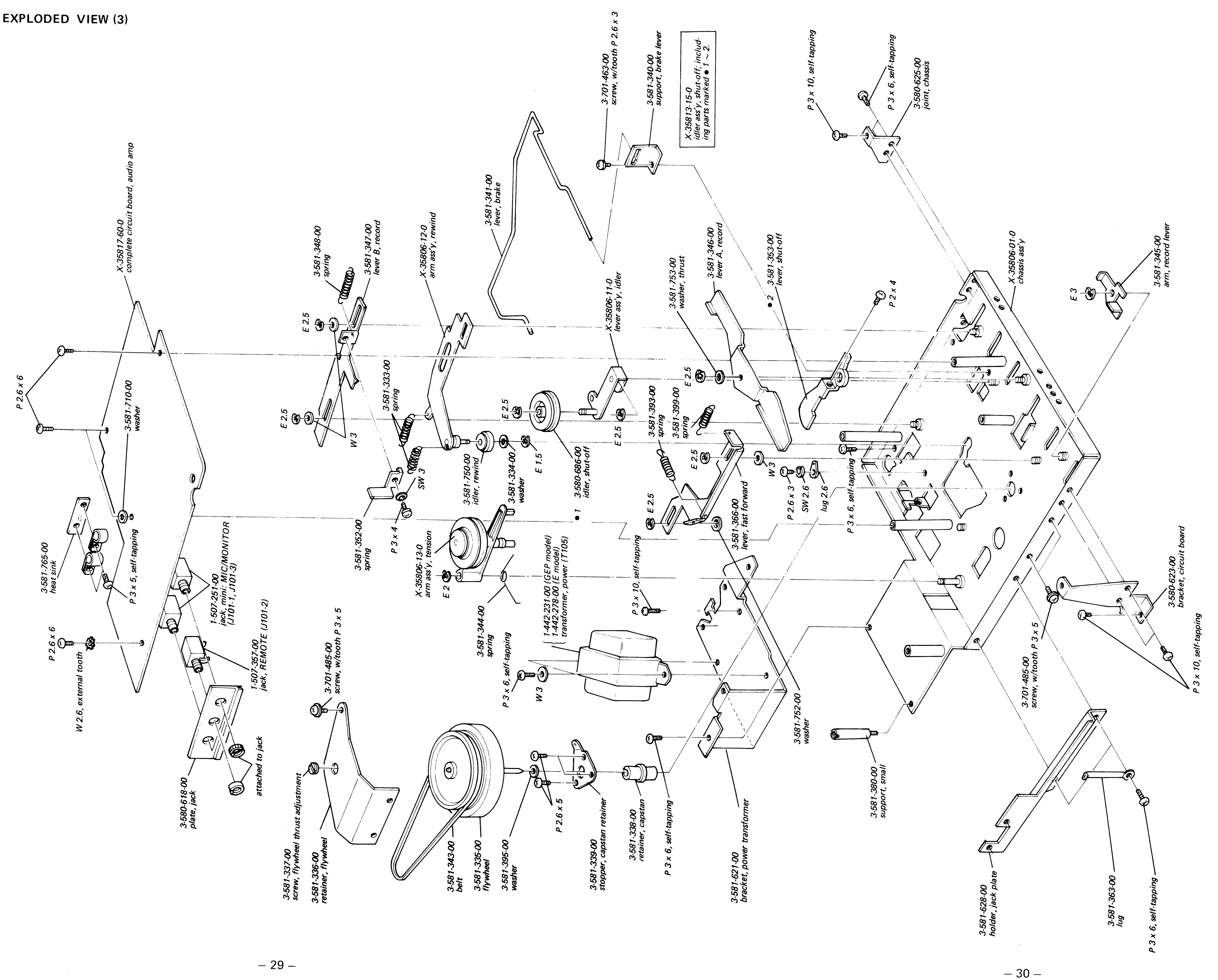
5-2. EXPLODED VIEW (2)


P 2.6 x 6
SW 2.6
3-581-369-00
collar, fast forward idler lever
X-35806-08-0
idler ass'y, fast forward
Motor (D-009G3)
8-834-009-10
motor, D-009G3 (M)
3-581-327-01 (no mark)
3-581-327-11 (red)
3-581-327-21 (black)
pulley, motor
(–) SC 2 x 3
3-701-467-00
screw, w/tooth P 2 x 5
3-581-749-00
retainer, cassette
8-829-336-00
head, record/playback;
PP134-36 (RPH)
3-581-354-00
pick-up, tension
E 3
3-581-356-00
spring
3-581-355-00
lever, tension pick-up
P 2 x 8
W 2
8-825-566-00
head, erase; EBF5-02B
(ferrite) (EH)
E 1.5
3-581-324-00
holder, erase head
3-581-325-00
spring
3-701-463-00
screw, w/tooth P 2.6 x 3
P 2.6 x 5
3-581-751-00
clamp, wire
3-581-362-00
holder
SW 2.6
3-581-367-00
collar, head deck holder
3-581-319-00
spring
steel ball 2
E 2
E 2.5
3-581-323-00
spring
3-581-320-00
guide, tape
X-35806-05-0
roller ass'y, pinch
E 2.5
3-581-736-00
cap, take-up reel
3-580-663-00
spring
X-35806-04-0
deck ass'y, head
3-581-364-00
plate, head deck adjusting
3-581-365-00
spring
E 1.2
P 2.6 x 5
3-581-322-00
arm, brake
3-581-388-00
cap, supply reel
3-581-321-00
guide, cassette
X-35806-07-0
reel spindle ass'y, supply
3-581-363-00
lug
○ 7 X-35813-16-0
plate ass'y, operating
X-35806-18-0
reel spindle ass'y, take-up
PS 2.6 x 5
3-581-391-00
spring
○ 12 3-581-746-00
spring
3-581-390-00
washer
3-701-467-00
screw, w/tooth P 2 x 5
P 2.6 x 5
○ 9 3-581-305-00
frame B
1-516-378-00
switch, leaf; motor (S102)
○ 14 3-581-743-00
spring B
○ 13 3-581-744-00
spring A
○ 10 3-581-745-00
lever, push
PS 2.6 x 5
○ 8 3-581-304-00
frame A
3-581-351-00
spring
3-581-350-00
pin
3-581-349-00
lever, miserase preventing
PS 2.6 x 5
3-581-330-00
spring
○ 5 X-35813-06-2
pushbutton ass'y, REC
SW 2
3-701-463-00
screw, P 2.6 x 3;
w/tooth
P 2 x 4
3-581-321-00
guide, cassette
○ 11 3-581-307-00
lever, stop
○ 2 X-35813-04-0
pushbutton ass'y, fast forward
○ 15 3-581-357-00
lever A, EJECT
D-009G
D-009G3
5.9
3-581-738-00
5.2
3-581-732-00
8
3-581-739-00
6.5
3-581-734-00
cushion
○ 4 X-35813-06-1
pushbutton ass'y, forward
W 3 (large)
○ 6 X-35813-07-0
pushbutton ass'y, stop
screw
P 2.6 x 3
○ 3 X-35813-05-0
pushbutton ass'y, rewind
SW 2.6
3-580-626-00
washer
3-581-361-00
holder A, head deck
○ 1 X-35813-03-0
pushbutton ass'y, EJECT
steel ball 2
3-701-462-00
screw, w/tooth P 2.6 x 4
3-581-358-00
lever B, EJECT
X-35806-01-0
chassis ass'y
X-35813-01-0
pushbutton ass'y
including parts marked ○ 1 ~ 15
3-581-360-00
spring
P 2.6 x 8
3-581-359-00
collar, EJECT lever

Note:

- ○ Items without part number and description are not available.
- ○ All screws are Phillips (cross recess) type unless otherwise noted.
  (–) = slotted head

5-3. EXPLODED VIEW (3)


X-35817-60-0 complete circuit board, audio amp
P 2.6 x 6
3-581-710-00 washer
3-581-765-00 heat sink
P 3 x 5, self-tapping
1-507-251-00 jack, mini: MIC/MONITOR (J101-1, J101-3)
P 2.6 x 6
W 2.6, external tooth
1-507-357-00 jack, REMOTE (J101-2)
3-580-618-00 plate, jack
attached to jack
3-581-348-00 spring
3-581-347-00 lever B, record
E 2.5
E 2.5
W 3
3-581-333-00 spring
SW 3
X-35806-12-0 arm ass'y, rewind
3-581-352-00 spring
P 3 x 4
3-581-750-00 idler, rewind
3-581-334-00 washer
E 1.5
E 2.5
3-580-686-00 idler, shut-off
X-35806-13-0 arm ass'y, tension
E 2
●1
1-442-231-00 (GEP model)
1-442-278-00 (E model)
transformer, power (T105)
3-581-344-00 spring
P 3 x 6, self-tapping
W 3
3-701-485-00 screw, w/tooth P 3 x 5
3-581-337-00 screw, flywheel thrust adjustment
3-581-336-00 retainer, flywheel
3-581-343-00 belt
3-581-335-00 flywheel
3-581-395-00 washer
P 2.6 x 5
3-581-339-00 stopper, capstan retainer
3-581-338-00 retainer, capstan
P 3 x 6, self-tapping
3-581-621-00 bracket, power transformer
3-581-341-00 lever, brake
3-701-463-00 screw, w/tooth P 2.6 x 3
3-581-340-00 support, brake lever
X-35813-15-0 idler ass'y, shut-off; including parts marked ● 1 ~ 2.
X-35806-11-0 lever ass'y, idler
E 2.5
3-581-393-00 spring
3-581-399-00 spring
E 2.5
E 2.5
3-581-366-00 lever, fast forward
P 3 x 10, self-tapping
3-581-753-00 washer, thrust
3-581-346-00 lever A, record
●2
3-581-353-00 lever, shut-off
P 2 x 4
E 2.5
W 3
P 2.6 x 3
SW 2.6
lug 2.6
P 3 x 6, self-tapping
3-581-752-00 washer
3-581-380-00 support, small
P 3 x 10, self-tapping
P 3 x 6, self-tapping
3-580-625-00 joint, chassis
X-35806-01-0 chassis ass'y
E 3
3-581-345-00 arm, record lever
3-580-623-00 bracket, circuit board
3-701-485-00 screw, w/tooth P 3 x 5
P 3 x 10, self-tapping
3-581-628-00 holder, jack plate
3-581-363-00 lug
P 3 x 6, self-tapping

Note:

- ○ Items without part number and description are not available.
- ○ All screws are Phillips (cross recess) type unless otherwise noted.
  (−) = slotted head

SECTION 6

ELECTRICAL PARTS LIST

COMPLETE CIRCUIT BOARDS

Ref. No.	*Part No.*	*Description*
	X-35817-60-0	Audio Amp
	X-35817-61-0	Radio
	X-35817-65-0	Fuse (E model)
	X-35817-66-0	Fuse (GEP model)
	X-35817-68-0	Voltage Selector (E model)
	X-35817-69-0	Voltage Selector (GEP model)

SEMICONDUCTORS

Transistors

Ref. No.	*Part No.*	*Description*
Q1		2SC839J
Q2		2SC839F
Q3		2SC839H
Q4, 5		2SC839F
Q6		2SC839H
Q7		2SC839F
Q8		2SC839J
Q101		2SC900E
Q102, 103		2SC945P
Q104 ~ 106		2SC945Q
Q107		2SD261V
Q108		2SD187

Diodes

Ref. No.	*Part No.*	*Description*
D1		CDG22
D2 ~ 4		1S188FM
D5		1S553
D6		KZ5AT
D7		CDG22
D101		CDG22
D102 ~ 106		1S188AM
D107 ~ 109		1N4002

COILS

Ref. No.	*Part No.*	*Description*
L1	1-405-530-00	FM Ant
L2	1-425-887-00	FM rf
L3	1-425-886-00	FM Osc
L4	1-425-885-00	I-F Trap
L5	1-405-690-00	MW Osc
L6	1-405-689-00	SW Osc
L7	1-401-628-00	SW Ant
L8	1-407-825-00	I-F Trap
ANT-2	1-401-592-00	MW Bar Ant
L101	1-407-824-00	Choke, 4 μH

TRANSFORMERS

Ref. No.	*Part No.*	*Description*
T1	1-403-930-00	FM IFT
T2	1-403-932-00	FM IFT
T3	1-403-931-00	FM IFT
T4	1-403-929-00	AM IFT
T101	1-423-203-00	Input
T102	1-423-203-00	Driver
T103	1-427-375-00	Output
T104	1-405-634-00	Bias Osc
T105	1-442-278-00 1-442-231-00	Power (E model) Power (GEP model)

CAPACITORS

All capacitors are in μF and ceramic type unless otherwise indicated. 50 or less working volts are omitted except for electrolytic type. (elect = electrolytic, p = μμF)

Ref. No.	*Part No.*	*Description*
C1	1-102-960-11	24 p
C2	1-102-958-11	20 p
C3, 4	1-101-006-11	0.047
C5	1-102-937-11	4 p
C6	1-102-973-11	100 p
C7	1-102-960-11	24 p
C8	1-102-950-11	13 p
C9	1-101-003-11	0.0047
C10	1-102-939-11	2 p
C11 ~ 13	1-101-006-11	0.047
C14	1-102-944-11	7 p
C15	1-102-960-11	24 p
C16	1-102-951-11	15 p

Ref. No.	*Part No.*	*Description*		
C17	1-102-945-11	8 p		
C18 ~ 23	1-101-006-11	0.047		
C24	1-101-002-11	0.0022		
C25	1-101-006-11	0.047		
C26	1-123-961-11	4.7	25 V	elect
C27	1-123-078-11	2200	6.3 V	elect
C28	1-105-514-12	0.012		mylar
C29	1-123-961-11	4.7	25 V	elect
C30, 31	1-101-002-11	0.0022		
C32	1-105-514-12	0.012		mylar
C33	1-105-515-12	0.015		mylar
C34	1-105-514-12	0.012		mylar
C35	1-102-937-11	4 p		
C36	1-105-509-12	0.0047		mylar
C37 ~ 39	1-101-006-11	0.047		
C40	1-102-971-11	82 p		
C41	1-105-506-12	0.0027		mylar
C42	1-103-711-11	270 p		polystyrol
C43	1-102-943-11	6 p		
C44	1-103-732-11	2000 p		polystyrol
C45	1-101-003-11	0.0047		
C46	1-102-943-11	6 p		
C47	1-101-886-11	62 p		
C48, 49	1-101-006-11	0.047		
C50	1-101-001-11	0.001		
C51	1-123-961-11	4.7	25 V	elect
C52	1-105-507-12	0.0033		mylar
C53	1-101-886-11	62 p		
C54	1-105-526-12	0.12		mylar
C55	1-101-006-11	0.047		
C56	1-102-971-11	82 p		
C57 ~ 59	1-101-006-11	0.047		
C61	1-102-973-11	100 p		
C101	1-119-357-11	10	16 V	elect
C102	1-119-197-11	100	6.3 V	elect
C103	1-119-366-11	0.47	50 V	elect
C104	1-102-823-11	430 p		
C105	1-102-977-11	200 p		

Ref. No.	*Part No.*	*Description*		
C106	1-121-951-11	0.47	50 V	elect
C107	1-121-979-11	47	6.3 V	elect
C108	1-121-968-11	10	16 V	elect
C109	1-119-366-11	0.47	50 V	elect
C110	1-105-505-12	0.0022		mylar
C111	1-119-363-11	4.7	25 V	elect
C112	1-105-507-12	0.0033		mylar
C113	1-119-343-11	47	6.3 V	elect
C114	1-121-976-11	100	10 V	elect
C115	1-119-343-11	47	6.3 V	elect
C116	1-102-977-11	200 p		
C117	1-121-975-11	47	10 V	elect
C118	1-121-980-11	100	6.3 V	elect
C119	1-105-519-12	0.033		mylar
C120	1-105-517-12	0.022		mylar
C121	1-121-977-11	220	10 V	elect
C122	1-121-968-11	10	16 V	elect
C123, 124	1-121-961-11	4.7	25 V	elect
C125	1-105-517-12	0.022		mylar
C126	1-121-951-11	0.47	50 V	elect
C127	1-121-990-11	22	16 V	elect
C128		--------------		
C129	1-105-517-12	0.022		mylar
C130	1-121-961-11	4.7	25 V	elect
C131	1-121-976-11	100	10 V	elect
C132, 133	1-105-515-12	0.015		mylar
C134	1-101-798-11	0.2		
C135	1-119-343-11	47	6.3 V	elect
C136	1-105-513-12	0.01		mylar
C137	1-105-509-12	0.0047		mylar
C138	1-105-513-12	0.01		mylar
C139	1-105-505-12	0.0022		mylar
C140	1-121-980-11	100	6.3 V	elect
C141	1-105-509-12	0.0047		mylar
C142	1-121-968-11	10	16 V	elect
C143	1-105-501-12	0.001		mylar
C144	1-123-074-11	2200	10 V	elect
C145, 146	1-101-005-11	0.022		

Ref. No.	*Part No.*	*Description*
C147	1-121-977-11	220 10V elect
C148	1-101-005-11	0.022
C149	1-101-006-11	0.047
VC1-1 ~ 4	1-151-297-00	Tuning
TC1-1 ~ 4	1-141-172-00	Trimmer
TC2-1 ~ 2	1-141-172-00	Trimmer

RESISTORS

All resistors are in Ω. ¼ W, ± 5 % carbon type resistors (except special type) are omitted. Check the schematic diagram for the resistance values. (k = 1000)

R144	1-244-841-11	47 ½W
R157	1-244-829-11	15 ½W
VR1	1-224-672-00	10k (A), variable; VOLUME
VR2	1-224-673-00	5k (A), variable; TONE

SWITCHES

S1	1-516-744-00	Rotary-slide, BAND SELECT
S2	1-516-746-00	Lever-slide, RADIO ON/OFF
S101	1-516-377-00	Slide, record/playback
S102	1-516-378-00	Leaf, motor
S103	———	Included in AC INPUT connector
S104	1-516-174-00	Socket, voltage selector (GEP model)
	1-516-267-00	Socket, voltage selector (E model)

JACKS

J101-1	1-507-251-00	Mini, MIC
J101-2	1-507-357-00	REMOTE
J101-3	1-507-251-00	Mini, MONITOR
CNJ	1-509-510-00	Connector, AC INPUT (GEP model)
	1-509-511-00	Connector, AC INPUT (E model)
	1-507-484-00	Connector, JACK
	1-508-771-00	Connector, PLUG

CERAMIC FILTERS

CF1	1-527-184-11	Red
	1-527-184-12	Blue
	1-527-184-13	Orange
	1-527-184-14	Black
	1-527-184-15	White
CF2	1-403-164-00	

MISCELLANEOUS

EH	8-825-566-00	Head, erase; EBF5-02B
F101	1-532-120-00	Fuse, 100mAT (E model)
	1-532-390-00	Fuse, 63mAT (GEP model)
F102, 103	1-532-391-00	Fuse, 500mAT (GEP model)
M	8-834-009-10	Motor, D-009G3
ME	1-520-171-00	Meter, REC/BATTERY
MIC	8-814-190-10	Microphone, electret condenser; C-1002A
RPH	8-829-336-00	Head, record/playback; PP134-36
SP	1-502-479-00	Speaker
TEL ANT	1-501-072-00	Antenna, telescopic
	1-533-103-00	Holder, fuse

ACCESSORIES & PACKING MATERIALS

Part No.	*Description*
X-3701-018-2	Tip, head cleaning
1-504-034-12	Earphone, ME-20
1-506-309-00	Plug, short; SP-100
1-528-026-00	Battery, size "C"
1-534-830-00	Cord, power; DK-33
3-580-630-00	Cushion
3-581-739-00	Carton
3-581-740-00	Label, fuse (E model)
3-701-627-00	Bag, polyethylene
3-701-639-00	Bag, polyethylene
3-701-683-00	Card, voltage (E model)
3-701-684-00	Card, voltage (GEP model)
3-780-355-51	Manual, instruction (E model)
3-780-695-00	Manual, instruction (GEP model)
3-793-010-20	Booklet, tape talk
3-793-408-11	Leaflet
3-793-455-21	Tag, caution
8-890-205-00	Tape, C-30

SECTION 7

HARDWARE

SCREWS

All screws are Phillips (cross recess) type unless otherwise indicated. (–): slotted head

Part No.	*Description*
7-621-255-28	P 2.6 x 10
7-621-255-42	P 2 x 6
7-621-255-58	P 2 x 8
7-621-259-14	P 2.6 x 3
7-621-259-45	P 2.6 x 5
7-621-259-48	P 2.6 x 6
7-621-259-59	P 2.6 x 8
7-621-259-68	P 2.6 x 10
7-621-305-35	(–) F 2 x 5
7-628-146-01	P 3 x 5
7-682-126-00	(–) SC 2 x 3
7-682-147-01	P 3 x 6
7-682-549-05	B 3 x 10 (black)
7-682-646-01	PS 3 x 5
7-682-654-05	PS 2.6 x 5
7-685-104-01	P 2 x 6, self-tapping
7-685-145-01	P 3 x 6, self-tapping
7-685-147-01	P 3 x 10, self-tapping
7-685-151-01	P 3 x 20, self-tapping
7-685-164-01	P 3 x 8, self-tapping

WASHERS

Part No.	*Description*
7-623-105-01	2
7-623-107-11	2.6
7-623-108-11	3
7-623-207-21	2.6, spring
7-623-212-21	5, spring
7-623-407-01	2.6, w/ext. tooth

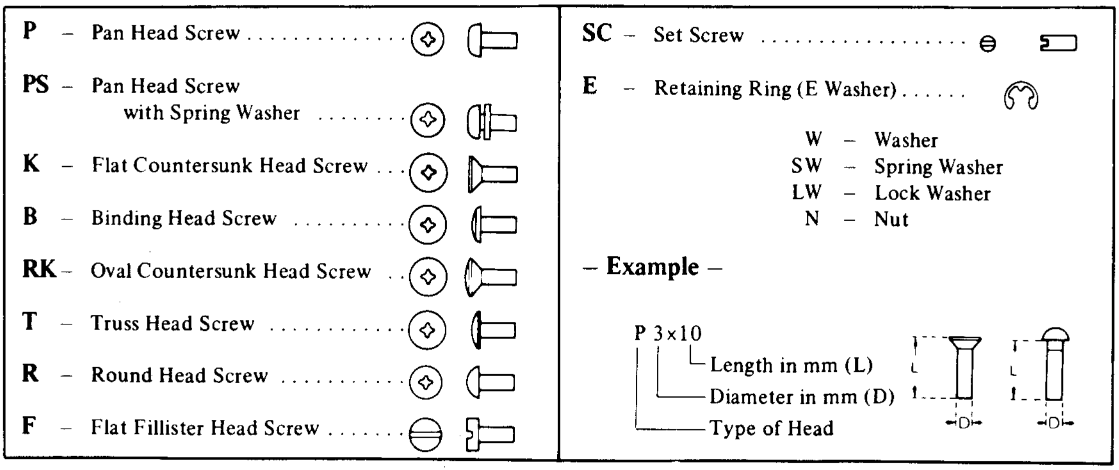
RETAINING RINGS

Part No.	*Description*
7-624-101-01	E 1.2
7-624-102-01	E 1.5
7-624-104-01	E 2
7-624-105-01	E 2.5
7-624-106-01	E 3
7-684-021-00	Nut 2
7-684-022-00	Nut 2.6
7-684-025-00	Nut 5

MISCELLANEOUS

Part No.	*Description*
7-623-616-01	Eyelet, 2 x 3
7-625-208-80	Rivet, R 2 x 8
7-633-120-31	Dial Cord, 0.3 mm dia.
7-633-120-41	Dial Cord, 0.4 mm dia.
7-671-112-01	Steel Ball, 2

—— Hardware Nomenclature ——



P – Pan Head Screw

PS – Pan Head Screw with Spring Washer

K – Flat Countersunk Head Screw

B – Binding Head Screw

RK – Oval Countersunk Head Screw

T – Truss Head Screw

R – Round Head Screw

F – Flat Fillister Head Screw

SC – Set Screw

E – Retaining Ring (E Washer)

W – Washer
SW – Spring Washer
LW – Lock Washer
N – Nut

– Example –

P 3x10
Length in mm (L)
Diameter in mm (D)
Type of Head

When ordering replacement parts, use PART NUMBERS listed in Parts List or shown in EXPLODED VIEWS. Parts List reference numbers should not be used.

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5C0516-1
Printed in Japan